THE PSYCHOLOGY
OF
FUNCTIONAL NEUROSES

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BY

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TO
MY COLLEAGUE AND FRIEND
PROFESSOR WILLIAM PEPPERRELL MONTAGUE

But this one thing may be said, that psychology cannot portray the beautiful. Its work is not to admire but to explain; not to exhibit curiosities but to make man as he is generally comprehensible; neither to raise him to heaven, nor to fix him immovably in the dust; not to close the lines of investigation, but to open them.—HERBART, 1816.

PREFACE

It is psychologically as well as socially and medically desirable that representative cases of the functional neuroses be accorded the more thorough individual and group attention already given to the various other neuropsychiatric conditions. From this point of view it is fortunate that during the recent war a special hospital was designated where soldiers with persistent psychoneurotic symptoms were assembled for further observation and diagnosis, care and treatment. U. S. A. General Hospital No. 30, at Plattsburg Barracks, N. Y., was so designated. Along with the other hospital services, a psychological service was established, of which the writer was the director.

Along with the routine duties of the service, which was also charged with the conduct of occupational therapy, a group of about 1,200 consecutive cases was given special attention. Through the courtesy of the medical staff and the cordial coöperation of the various hospital services, complete data and records concerning all cases were accessible. Personal observations of

all cases and extended examination and observation of cases of special interest were facilitated. Psychological examinations were made of each individual, of such range and technique as the case and the interest and time of the psychological staff seemed to warrant. The briefest examination undertaken was such an investigation of intellectual capacity and mental alertness as would enable a record to be made of the individual's mental age. The examinations ranged from this minimum to cases studied for a total of ten hours or more, by nearly every available form of qualitative and quantitative psychological technique.

The value of such an opportunity is apparent. Here was an array of over a thousand psychoneurotics, whose symptoms were at least of such definite character that the individuals were found unadaptable to the conditions of service in a group enterprise. They were, however, not so extreme as to have kept these patients from being included in the military draft or accepted by the recruiting service. Although something like two-thirds of the cases appeared to represent conditions existing prior to enlistment, it would have been entirely impossible, under the ordinary conditions of civil life, to have submitted them to scientific examination. The symptoms presented probably in-

cluded every detail recorded in the literature, and differed in no essential respect from the familiar symptoms encountered under non-military emergencies.

It so happened, moreover, that about midway in the progress of the investigation an event occurred which gave unique value to the observations. This event was the declaration of the armistice and the cessation of active hostilities, with the resultant change of motivation on the part of the hospital population and staff. This constituted, on a wholesale scale entirely unanticipated, a magnificent experiment in psychotherapy. The therapeutic effects of this event were not only observed in the casual way so frequently reported, but quantitative measure was secured of the differential effects in the case of the various diagnostic groups.

In the classification of patients in the data here reported, the final diagnoses as recorded in the patients' clinical record were followed. No attempt is made to explain the significance of these various categories, since they accord with the common use of the terms in contemporary neuropsychiatric literature. Readers unfamiliar with the terms will find them clearly explained and illustrated in the modern texts in psychiatry.

The use of the classification "Psychoneurosis," however, requires explanation. In a certain number of cases, although the patient's condition was recognized as "psychoneurotic" or "functional," his particular classification was not determined at the time the psychological records were completed. In order to utilize the data from these cases they are grouped under one heading and indicated in the records as "Psychoneurosis," which always implies, in the tables and records, "not further specified."

It is with both pleasure and gratitude that reference is here made to the particularly cordial and valuable coöperation of Dr. R. B. Hutchings and Dr. A. J. Rosanoff during the writer's connection with the psychological service in General Hospital No. 30, and to the expert assistance of Dr. Georgina I. Stickland in the preparation of the statistical data.

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PSYCHOLOGY OF FUNCTIONAL NEUROSES

CHAPTER I

INTRODUCTORY ACCOUNT

Among the varieties of mental and nervous inadequacy and disturbance, the psychoneuroses have long been recognized as presenting problems of particular psychological interest. The variable character of psychoneurotic symptoms, their susceptibility to the modifying influences of suggestion, motivation, analysis and reëducation, have stimulated the development of numerous techniques of psychotherapy. Their responsiveness to such familiar devices as prayer, confession, and other devotional ceremonials has given them a dramatic importance in the history of religion and medicine. Reports of miracles and faith cures, and of the disappearance of symptoms in the presence of relics, shrines, and similar accessories of piety, have always aroused popular interest in the "mental" or "spiritual" as contrasted with the "material" or "organic." The lack of correlation between psychoneurotic symp-

toms and recognized structural imperfections or lesions of the nervous system has led to the traditional medical distinction between functional and organic disorders. Such a distinction is implied, for example, in references to "purely mental disorders," and in the characterization of hysteria as a "psychological disease."

During the past quarter-century, in particular, the systematic development of "mental medicine," "psychotherapy," "psychoanalysis" and similar concepts has displayed remarkable vigor. Along with this activity has gone a voluminous description of the forms and varieties of functional disorder, and an intensive study and detailed interpretation of individual cases. In part, this development has been occasioned by the increasing complications of civilized life, which render conspicuous many signs of inadequacy and maladjustment formerly disregarded both by society at large and also by the individuals concerned. But the chief impetus has perhaps been the growing recognition of the importance of psychogenic factors in the production of faulty adaptation to the experiences, constraints and exigencies of social life.

Throughout the history of psychopathology, *conflict* has been emphasized as a conspicuous fac-

tor in the production of mental disorder. In the early demonological period this was commonly described as a struggle between the person of the patient and one or more of a host of supernatural devils who sought to possess his body and to control his acts. Under the influence of monotheism these legions of devils fused into the arch-demon, Satan, to whose power the patient had yielded, and in whose name he perpetrated heretical doctrine, unsocial practices, and nefarious sorcery. The epileptic stupor following upon a convulsion thus signified, for example, that after a violent struggle, the patient had yielded and had now left his inert body while he went, in spirit, on an unholy tryst or orgy with the Devil.

Under the influence of ecclesiastic dogma this ascription of active intercourse with Satan gradually changed into an accusation of sinfulness. The idea of conflict was still uppermost, the benign and malignant deities competing for the patient's allegiance. He had chosen to serve Belial and his symptoms represented a just punishment inflicted by a jealous God, "even unto the third and fourth generations of them that hate him." This conflict of the benign and malignant powers in the individual's life, and the ensuing nervous and mental consequences is clearly expressed by

Heinroth as late as the beginning of the nineteenth century. "Whatever one may say, there is no mental disease except where there is complete defection from God. Where God is, there is strength, light, love and life; where Satan is, there is weakness, darkness, hatred and destruction everywhere. An evil spirit abides therefore in the mentally deranged; they are the truly possessed. . . . In short, we find the essence of mental disease in the partnership of the human soul with the evil principle." For Heinroth the mentally diseased are the children of the Devil, just as the righteous are the children of God.

A more psychological and less supernatural account of the rôle of conflict was suggested when Herbart located the scene of struggle within the individual's own mind, and described it as a "conflict of ideas." The following quotations from an English translation of Herbart's "Text Book of Psychology" will indicate this point of view, which has been richly capitalized in the more modern "Freudian psychology."

> Concepts become forces when they resist one another. This resistance occurs when two or more opposed concepts encounter one another. Concepts that are not opposed . . . offer no resistance to one another (e.g., a tone, and a color).

Resistance is an expression of force. To the resisting concept, however, its action is quite accidental; it adjusts itself to the attack which is mutual among concepts. . . . In themselves, however, concepts are not forces. . . .

Now what is the result of the resistance mentioned? Do concepts partially or wholly destroy one another, or, notwithstanding the resistance, do they remain unchanged? Destroyed concepts are the same as none at all. However, if, notwithstanding the mutual attack, concepts remain unchanged, then one could not be removed or suppressed by another. . . . The concept then must yield without being destroyed, i.e., the real concept is changed into an effort to present itself . . . as soon as the hindrance yields the concept by its own effort will again make its appearance in consciousness.

Here the expression "threshold of consciousness" must be explained. . . . A concept is in consciousness in so far as it is not suppressed but is an actual representation. When it rises out of a condition of complete suppression it enters into consciousness. Here then it is on the threshold of consciousness . . . so that at the slightest yielding of the hindrance it would begin to rise into consciousness. . . . In this case, however, the striving of the suppressed concept is not to be considered wholly ineffective; . . . it works with all its force against the concepts in consciousness. . . .

The easily conceivable metaphysical reason why opposed concepts resist one another is the unity of the soul, of which they are the self-preservations. . . . Concepts that are on the threshold of consciousness cannot enter into combination with others, as they are completely transformed into effort directed against other

concerted schools. Although many workers have taken part in this enterprise, the two groups may be represented by the more familiar names of Kræpelin-Janet-Binet on the one hand and Freud-Jung-Adler on the other.

In the work of Kræpelin, Binet, and their followers, effort was made to determine, through measurement and quantitative description, the mental make-up and predisposition of patients showing recognizable pictures of maladaptation and inadequacy. Since the cognitive characteristics and the capacities have yielded more readily to measurement than have the affective and conative aspects of human nature, these methods have been most serviceable in the study of conditions of constitutional intellectual weakness and states of mental deterioration. Janet, meanwhile, attending particularly to the symptoms of hysteria, sought to formulate general concepts which would convey an impression of the characteristic reactions here displayed. Without adhering to the concept of internal conflict in the Herbartian sense, his attention was nevertheless drawn particularly to the energic or dynamic features of nervous organization. Such concepts as "insufficient psychic energy," "psychological weakness," "inadequate synthesis," "dissociated

states," "retraction of the field of consciousness," represent this point of view. While definitely relating to the energic feature of personality, these concepts suggest inertness, weakness, passive failure of adaptation, rather than active conflict. They have a particular virtue, in that they seek to proceed in terms of principles familiar and relevant to systematic neuropsychiatry, they avoid the use of analogy so far as possible, and contain no traces of animistic explanation.

Distinguished from the point of view of Kræpelin-Janet-Binet in terminology and concept, the Freud-Jung-Adler approach is nevertheless closely related in definite ways. Here also emphasis is placed on the features of individual make-up and disposition, rather than on structural defect and traumatic episode. The distinguishing characteristic of this school is its development of the Herbartian scheme of conflict. In developing the Herbartian conception the affect and impulse, the emotion and instinct, the "wish" and "mechanism," are substituted for the "idea" or "concept." The remaining elements are retained in much the same form that Herbart proposed them, —the threshold of consciousness, the rivalry of elements, the suppression of the weaker by the dominant, persistence of the suppressed element

below the threshold, its transformation (distortion, conversion) in the effort to express itself, the conscious, the fore-conscious, the un-conscious fields, are adopted bodily. They are, however, elaborated much beyond the schematic Herbartian account, illustrated with a wealth of clinical incident, and the conflicting elements are more specifically characterized. Analogical reasoning is freely indulged in and animistic thinking not entirely eschewed. Indeed, the systematic student of the subject often comes to feel that "psychoanalogy" rather than "psychoanalysis" should be the technical term associated with this point of view.

The Freud-Jung-Adler point of view has been most fully developed in the field of the psychoneuroses, and is chiefly concerned with the analysis and description of the affective and conative dispositions in such cases. Little or no attention is given to the cognitive or intellectual endowment and there is no explicit recognition that intellectual make-up contributes in any important way to the genesis of symptoms. As a matter of fact very little seems to be known concerning the intellectual status of the psychoneurotic and the relation of this status to their neuroses. This is in part due to the fact that although provision is commonly made whereby the feeble-minded, insane,

epileptic, blind and deaf, delinquent, criminal and pauper may be assembled in institutions for care, treatment and study, no such provision is made for the neurotic. Most of this class remain unidentified or only incidentally discovered. Those resorting to the general medical practitioner for assistance commonly go unrecognized and misunderstood. Those consulting the neuropsychiatric specialist are likely to represent either extreme cases or selections on some such basis as affluence or social status.

In the chapters which follow, two somewhat distinct projects are undertaken, which are, however, closely related in both theoretical and practical interest. There is first presented the exposition of a concept which is suggested as a useful psychological description of the psychoneurotic constitution. This concept is further illustrated by its application to representative clinical pictures, by a discussion of the various levels on which the mechanism is exhibited, the differences between its normal and abnormal degrees of manifestation, and its bearing on the intellectual make-up of the neurotic.

The second project consists in the presentation of confirmatory data, summarizing the results of the psychological examination of over a thousand

psychoneurotic individuals. The influence of changed motivation dependent on the armistice is considered in detail and separate chapters are given to the presentation of topics bearing incidentally on the more general problems. A final chapter gives a systematic account of the functions of a psychological service in a neuropsychiatric hospital.

CHAPTER II

THE MECHANISM OF REDINTEGRATION

An important type of inquiry in relation to the psychoneuroses is represented by the attempt to describe, in psychological terms, the type of reaction presented by these conditions. Discussions of constitutional and environmental etiological factors, of varieties and classification, of mode of onset, of the technique of relief, therapy, and reconstruction, are essentially practical in their motivation. Even the attempts to analyze the complex clinical picture into its constituent symptoms and to trace the psychogenic history of its development are likely to be undertaken as part of the technique of therapy, or at least from the point of view of hygiene and prophylaxis. From the point of view, however, of descriptive psychology, it is desirable to undertake the formulation of such general descriptive concepts as may be applicable to these cases conceived as types or tendencies, without regard to their medical classification or treatment.

Numerous descriptive concepts have been sug-

gested in the past, but a psychological inadequacy characterizes them all. Some of these concepts are intrinsically unintelligible; others are so general and barren that they fail to convey the essential aspect of any individual picture; others involve entirely new conceptions which do not fit in with the accepted systematic accounts of mental processes. In many cases no adequate neurological account of the processes described is available. It is highly desirable that such an account be as simple and non-mystical as the facts warrant, and sufficiently real to represent the actual clinical pictures encountered.

Among these proposed descriptive concepts may be enumerated those of "transfer of libido," "symbolism," "regression," "conditioned reaction," "pithiatism," "conversion," "general suggestibility," "dissociation," "fixation," etc. It is true that in general no one of these concepts has been very successfully championed as universally descriptive of the psychoneurotic make-up in its many varieties, although occasional attempts of this character are not lacking.

No attempt will be made at this point to illustrate the manner in which these various concepts have been applied by their individual advocates. Nor will a detailed statement of their various in-

adequacies be attempted. But since it is proposed to substitute for these concepts a single principle that seems to have a wider and yet a more specific descriptive value, it may be well to point out very briefly some of their unsatisfactory features.

The concept of "symbolism" seems to have originated especially in occasional highly dramatic cases, in which obvious analogies were discernible between the clinical symptoms and some larger circumstances of the individual's life. When the attempt is made to carry this concept over to the more common-place pictures the application is made only through the elaboration of fantastic associative relations, objective similarities of a recondite sort, figures of speech, and archæological or philological leaps of the most unsupported and unbridled form. "Transfer of libido" suffers especially from the cock-sure obscurity of the "libido" and the general lack of any satisfactory account of the actual process involved in "transfer." "Siphoning of affects" and the "attachment of free-floating affects" are equally unsatisfactory and undescriptive. The "siphoning" is merely a hydraulic metaphor and the "affects" involve a nuclear conception of the mental stream which is, to say the least, anachronistic in the

extreme. "Sublimation" is more commonly used to designate such types of reaction as may preserve the individual from psychoneurotic involvement. Perhaps the most convenient concept in practice is that of "regression," since a reaction type that is not becoming to an adult is so pointedly characterized as "infantile," "childish," "juvenile" or "adolescent." The concept is however more picturesque than descriptive, since the alleged "infantilisms" are with a surprising infrequency at all like the actual conduct of babies. Even the "infantilism" turns out, under scrutiny, to be but a metaphor, or else merely a term of disapprobation.

If the "conditioned reaction" should ever cease to be heralded as a unique and recent discovery and were once recognized as perhaps the earliest of man's generalizations about the behavior of his neighbors, his children and his domesticated animals, it might perhaps constitute one of the most useful concepts yet proposed for the purpose here under discussion. As a simple illuminating concept it aptly describes many of the hysteric and neurasthenic symptoms. But the esoteric and Pawlowian atmosphere with which the concept has become invested by American reviewers does not favor its ready articulation with the

accepted principles of systematic psychology. It serves, in its present form, to describe the psychoneurotic picture in much the same fashion that the physician's hieroglyphic note to the pharmacist describes the very simple ingredients actually put into the bottle. There are, moreover, certain technical objections which emphasize the inadequacy of the "conditioned reflex" as a descriptive and explanatory concept. Some of these objections are suggested in a later chapter.

Such concepts as pithiatism, suggestion, dissociation, lack the specific descriptive character called for by concrete individual cases. It is in a sense true that all conduct is "suggested" by some factor in the environment or by some "representation." Simply to state that the source of the suggestion, in the case of the hysteric patient, is to be found in the symptoms of a fellow patient, in the technique and awkward interrogations of the examining physician, or the perusal of clinical records, fails to give an adequate account of the type of personality which such behavior characterizes. Dissociation, insufficient psychological synthesis, and similar concepts, lack entirely the dynamic descriptive value which a given concrete case merits and fail to account for the personal

and individual direction clearly present in the reaction of individual neurotics.

It seems nevertheless entirely possible to find a concept that is significantly descriptive of the psychoneurotic picture, that unerringly identifies the patient, explains the psychogenesis and idiosyncrasy of his symptoms, points the way to therapy and prophylaxis, and is yet intrinsically intelligible, is relevant to the systematic accounts of the average mind, and for which a neural counterpart or correlate is without difficulty conceivable. It is the purpose of this chapter and those immediately following to propose such a concept, and to suggest the manner in which it satisfies these very numerous but necessary criteria.

Hamilton long ago used the term "redintegration" to indicate the tendency of a complex idea to be reinstated upon the occurrence of one of its constituent parts. This atomic conception of the nature of an "idea" we may willingly relinquish, even though the substitution of "cortical pattern" for "idea" makes the term entirely compatible with current neurological theory. But the redintegrative mechanism, whereby a part reinstates a previous whole, is one of the most enlightening concepts ever offered to psychology, and, as the writer is convinced, to neuropsychiatry also.

If we make certain changes in the materials involved in the redintegrative process, it can be shown with little difficulty that this mechanism is most faithfully applicable to the psychoneurotic picture. The nature of the changes will be suggested by a statement of the nature of the redintegrative mechanism, as this mechanism is here conceived. Redintegration is to be conceived as that type of process in which a part of a complex stimulus provokes the complete reaction that was previously made to the complex stimulus as a whole. This is not precisely Hamilton's use of the term "redintegration," but the process is so similar that the term may be used here without injustice, since no better one suggests itself.

That a "part of an idea" may occur may be doubted, hence Hamilton's use of the concept fell into disrepute. But that a part of a stimulus may occur no one will probably dispute, and that such a partial stimulus may provoke a reaction previously made to the complete stimulus, may be easily demonstrated. A child is frightened by a large, black, growling and moving quadruped. Both stimulus and reaction are complex. On a later occasion the growl alone provokes the entire fright reaction, even when made by a parent crawling on all fours, or hiding behind the door.

This is the redintegrative mechanism. Under certain conditions, later to be specified, this type of reaction is the essential characteristic of the psychoneurotic make-up.

In the first place, the redintegrative mechanism may be seen in operation in countless places where it is not considered psychopathic. Untutored minds are especially likely to display the redintegrative type of thinking. Primitive magic seems to be largely based on the supposition that a part of an object or situation is potent to produce effects identical with those that follow on the presence of the complete stimulus. Darkness, wind, cold, lightning and thunder constitute the antecedent setting to a gratifying rain. Hence it is believed that simply reproducing one element of the antecedent (as a roaring noise) will result in rainfall and its harvest-making consequences. The footprint of the enemy, the sight of his weapon, the sound of his voice, are feared in much the same degree as is his actual attack. A very great part of the reactions and beliefs of primitive men is made up of just such conduct—acts which, if they should be exhibited by a man in modern life, would be considered psychoneurotic.

The essential feature of such conduct in primi-

tive magic consists in the fact that a part of the stimulus arouses the complete reaction which has previously occurred or should "properly" occur only in the presence of the entire situation. The appropriateness of such conduct obviously depends on the *relevance* of the part-stimulus. If the detail that occurs is what we commonly call a *significant* part, the response is a useful perceptual reaction. The more irrelevant the detail responded to the more lacking in sagacity, and hence the more psychoneurotic is the individual to be considered.

The various forms of fetishism, whether of the primitive sort or of the more modern forms found in the perverted instincts of sex, property, fear, etc., represent similarly a complex emotional response, properly aroused only by a correspondingly complex stimulus or situation. In the taboos and magic of primitive fetishism and in the reactions of the modern pervert these total responses are provoked by the occurrence of some very partial or remotely associated detail.

A drop of a comrade's blood, the crudely drawn profile of the enemy's features, the weapon or tooth or wedding ring of an ancestor stir the primitive and redintegrative consciousness with elaborate emotional patterns entirely dispropor-

tionate to the fragmentary stimulus determining them. In parts of Oceania and Africa the personality of a new chieftain and his vigorous methods of enforcing discipline are so fearfully impressed on the consciousness of his subjects that even the sound of his name provokes a total redintegrated reaction. Individuals bearing the same name immediately adopt a new one so as to avoid encountering the dreadful sound. The name is never pronounced. Any animal, plant, physical object or implement known by this name or by a name resembling and hence suggesting it becomes at once an object of taboo. Rationalized explanations of such phenomena are entirely unnecessary so long as the redintegrative concept suffices to make them intelligible.

Totemic man drank the blood of the fierce who were slain in battle, in order to appropriate their power. No doubt this redintegrative magic tended to arouse just such added courage as was more ordinarily aroused by the actual example of the individual warrior in action. More modern neurotics are similarly stimulated through the emotional reactions and the adrenal adjustments and compensations occasioned by the voice of a bishop, the bone of a saint, a phial of water from the Jordan, or the touch of a handkerchief mailed

by the secretary of some secular healer who has been given newspaper notoriety.

The scalp of an enemy, the antlers or pelt of a hunted animal, the statue of a hero, a brass button from a famous battlefield, a national hymn, a red flag, all possess their special virtue through the mechanism of the redintegrative reaction. Perhaps the kiss, the embrace and other varieties of caress, as well as the more servile forms of homage and respectful salutation derive their potency in a similar fashion, through redintegrated emotions ordinarily accompanying more fully executed attitudes.

The members of primitive Australian clans, with plant totems, threw portions of the plants into the air as a magic ceremonial in order to bring about an increased supply of these grasses. Because of the nature of plant propagation, of which the actors seem to have been ignorant, this method was actually attended by success, and the magical ceremony thus anticipated the more scientific procedures of sowing and tilling. But, reacting only to an outstanding and irrelevant detail, the Australians also sought to increase the supply of animals of the lizard totem by scattering about bits of a sacrificial lizard, or even, in still more redintegrative fashion, by molding a heap of

sand into the form and shape of a large lizard, then throwing this sand into the air. Thus the spatial relations, the simple perceptual details of form and shape, supplant the actual totem animal, even as the act of tossing into the air, again a simple perceptual detail, represents the whole process of increasing the crop.

Water removes physical filth. So also, for primitive minds, does it wash away the contamination and guilt of violated taboos. The washing is not symbolic, for primitive minds seem not to have recognized symbols of this degree of abstraction. The cleansing was actual, that is, magical. So also in a later ritualistic development do ablution, immersion and sprinkling remove the impurity of the soul and the consequences of original sin. Even in our modern christening ceremonials a dash of water or other fluid constitutes a vague antidote against future as well as past transgression, physical danger and accident, and in the case of physical objects, such as boats and buildings, it guards against the possibility of structural imperfections. Throughout this development, including even the most sophisticated symbolic performances of the ritual, the logic is that of redintegration. Reaction to an elementary

property of water determines a complex emotional response of the magical variety.

Such reasoning is by no means limited to the primitive thinking of the totemic age. Its contemporary occurrence is recognized in an editorial in the New York *Times* of Oct. 5, 1919, commenting on recent police raids on a number of east side coffee houses. "The police raid is an ominous event. If it be true that men of wicked and dissolute character, deprived of their alcoholic rendezvous, now forgather round the coffee pot, we may expect measures more stern than a mere raiding of the cafés. . . . Presently the coffee house will be in disrepute even as the rum parlor; and when it, too, has been abolished we may expect to hear of police raids on the loganberry lounge and the sarsaparilla saloon. One by one these harmless liquids will be abolished by constitutional amendment; and so peculiarly are we made in this country that it is not likely to occur either to police or to reformers that it might be more profitable to try to remove or abolish the wicked and dissolute men than to destroy in succession every place where they might assemble."

In a similar vein, Milton, writing in Areopagitica in 1644, against the ordinance of the Long Parliament and the Star Chamber relating to the

control and censorship of the press, found it necessary to insist that "they are not skillful considerers of human things, who imagine to remove sin by removing the matter of sin."

Infantile learning and childish thinking readily follow the redintegrative pattern. Every man with whiskers is called "papa," and any hairy quadruped, or even a muff or fur coat, is "kitty" to the child. Here the reaction is vocal or perceptual merely, or it may often be observed to take the form of overt conduct, but it shows the same characteristic mechanism as that observed in primitive magic—the complete reaction to a part, and often to a very insignificant part, of the original stimulus.

Dream experiences, again, afford many instances of this redintegrative mechanism. Some fragment of a stimulus is elaborated into a comprehensive event by calling up a complete interpretative pattern. The clang of a bell arouses the whole train of excitement normally attending a conflagration; the rush of water heard through the porthole is transformed into an elaborate oratorical effort. Thus the hypnagogic illusions and the presentative dreams display at the same time the redintegrative mechanism of infancy and

primitive magic and the naïveté of the psychoneurotic symptom.

Two typical hypnagogic records will serve to illustrate the importance of the redintegrative pattern in dream formation. At Victor Herbert's opening concert in 1909, L——, E—— and myself were talking of the cartoons of Mr. Bug in *Life*. L—— described a cartoon in which the six legs of Deacon Firefly were represented as grasping different objects such as a Bible, a prayer book, etc., while Mr. Bug held playing cards, a bottle, a cigar, etc. I had been working all day on comparative nervous anatomy, preparing a lecture on complications of stimulus and response, and had my head full of segments and nervous arcs. The orchestra played Grieg's "Wedding Day at Hegstad." In the last bar there were three finishing blasts with full orchestra. I had become very drowsy, and these blasts seemed to me to be the movements of some huge bug, which came sailing from behind the wings, suddenly alighting on the stage, first on the two hind feet, then bringing down the middle pair, and finally the two front feet, with the final blast. The visual elements present were of huge, vague, rather reddish brown jointed legs, the feet not clear, and only the lower ventral side of the body dimly suggested, but

flashing out at each "land" of the feet. Here it seems obvious that a faintly perseverating cortical pattern was vigorously aroused by rather trivial relational elements in the stimulus, the resulting fusion constituting the dream experience.

Observer L—— had a severe toothache during a given day, and though very sleepy and worn out could not sink into a sound slumber because of the pain. For several hours she lay in a state of semi-consciousness, tossing from side to side in a drowsy effort to find a comfortable position. All day she had been intently working on a coat which she was making, and her tossings back and forth were all in terms of the seams on the coat —that is, as she turned to the right the seam down the right side of the garment was inspected, then as that position gradually grew unbearable the seam began to wrinkle, to pucker, and to become quite unmanageable. Thereupon she decided to work a while on the other seam (turned to the left side) and carefully basted and pressed the seam on the left side of the coat. But, although it behaved satisfactorily for a time, it too soon began to wrinkle and the thread to snarl. In despair she attacked the seam on the right side again; that is, she turned over in bed to the right side once more. This continued for an indefinite

time. She was in despair and feared the garment would be quite ruined. All through these hours she was conscious of the slight and occasional flapping of the window blind and twice she replied quite sensibly to the questions of her companion, and noted the striking of the hours on a clock in a neighboring apartment. But the illusion that she was wrestling with the seams of a refractory garment was not dispelled until she fell asleep at daylight. Here again it is clear that the kinæsthetic and static stimuli kept active a cortical pattern that was already in a state of perseverative preparedness. The dream experience consisted only of the arousal of this redintegrative pattern by the current sensory impressions.

In ordinary conditions of exhaustion, fatigue, drowsiness, and delirium the redintegrative mechanism is conspicuous. Thus in one case observed, the subject had been steadily putting others through a series of exacting mental measurements. Day after day, and as often as 500 times a day, this subject had said to the person just about to begin to work at a mental test, "Ready, go!" At the end of a long day's work of this type the telephone bell rang and the subject answered the call. Taking down the receiver she leaned toward the mouthpiece and said, in the

customary brisk but now somewhat automatic manner, "Ready, go!" Here it was clear that the reaction was only to a portion of the situation. The feel of the instrument in the hand, the sight of the wall box, the standing attitude, and the recent intention to "go to the telephone" had no part in determining the response. The simple relational feature of the situation, "being ready to have another person begin something" brought out the older reaction to this situation as it occurred in another setting, rather than the conventional telephone salutation. By a quite similar mechanism the over-worked college instructor was actuated to request the street-car conductor to let her off "at page thirty-four."

Most of the devices of patriotism, the ceremonials of religious devotion, and many types of æsthetic response depend for their efficacy on the redintegrative process. The thrill of piety comes to be aroused by trivial details of the original setting—the hymn, the cross, the candle-stick, the incense. Patriotic fervor originating in a complex situation of national danger is thereafter stirred by the drum, the flag, the bugle call, the martial air.

Illustrations of the redintegrative basis of such æsthetic and emotional reactions are to be found

in every one's experience. The following typical instances are quoted from Sully's recent autobiography ("My Life and Friends," T. Fisher Unwin, 1918). In each of these instances a minor detail of an early experience, encountered in a new setting, stirs up the original affective reaction.

A second experience, recalled under the fuller blaze of memory's lamp, was the death of this sister. She was known and remembered among us as having a very gentle disposition and a deep, undemonstrative piety. The fervency of her piety was shown in her insisting, shortly before her death, on giving us all, sisters and brothers and servants, as well as parents and husband, a religious farewell. Her beautiful face, always delicate, was now refined away to an almost transparent mask for her ardent spirit, looking pleadingly at me as she whispered her last admonition to be "good," returns to my inner perception as I write. My intensified sensibility was, I remember, tortured during that solemn leave-taking by the sound of a hand-organ playing near the death chamber. That moment's experience of defiant horror may perhaps have started the growth of my lifelong and almost furious detestation of the naturalized British "grinder," from which the musical and cheery itinerant instrument one meets with in Italy must be carefully distinguished (12).

Referring to "the first uninstructed years of chapel-going," Sully writes: "The organ and choir were in a gallery at the back, and invisible from our pew. I drank in the music with a delicious wonder, and, if I

thought at all, referred it to some mysterious angelic choir. Perhaps the effect of this first introduction to the magic of good music lives on in the feeling with which the best music still inspires me—of being lifted high above terrestrial things" (23).

"It was a rather nice-looking, detached house with a lawn in front. Figures of Adam and Eve stood on either side of the gravel plot. They faced one another there in primal nudity, and I think that our first mother was holding out the fatal apple to her lord. The white statues had a weird fascination for me, possibly because their nudity and the naughty conduct of the lady invested the figures for my superstitious fancy with some sort of malign significance. The house and the two figures had recently been painted; and even to-day when I smell fresh paint the façade of that house flanked with the improper statues glimmers out for a moment from dark oblivion" (27).

Similarly the occurrence of a single detail, such as the scent of flowers, the noise of rain drops, the smell of peanuts, may revive *in toto* the emotional reaction previously associated with a much more complex situation. This is indeed the psychology of the "souvenir." Because of this redintegrative mechanism Napoleon's old shoes acquire merit and the bone of a saint comes to possess special virtue. Fetishism, whether of the religious, artistic, erotic or nationalistic form, is based on the possibility of this type of "transfer."

But the inaptness of the term *transfer,* more commonly used to describe this type of conduct, is apparent from the fact that no transfer of any kind has taken place. Even in the most symbolic of instances the reaction is to *some detail* of the previous total situation, now encountered perhaps, but by no means necessarily, in a new setting. Most animal training proceeds in just this fashion, by inducing the animal to make the total reaction when only some minor detail of the original situation is present, some word, gesture, or other cue. The scarecrow is a typical example.

It is important to note that the detail or fragment, which touches off the redintegrative reaction, need not take the more or less substantial form of a sensation, a sensory quality, nor need it be so objective a factor as an object, person or thing. Relational elements, details or analogies of form, structure and pattern, such as those that underlie the metaphor, the simile, the rhythm and the melody, are just as effective as are the most sensory qualities.

In language, indeed, we have this type of redintegrative mechanism at its height of development. We come to react to words just as we have previously reacted to the total situations with which the words have been associated as partial

details. This is why the poet, the orator, the novelist, can move us to action and to emotion. The writer well recalls the throbs produced in a newly vaccinated arm by Gunsaulus' lecture on Savonarola. The mere words produced the same vaso-motor reactions that might have resulted from witnessing the deeds themselves. This is just why words, verbal instructions, can so potently set up determining tendencies in the nervous system—they induce the response and the cortical sets that would otherwise be produced by the objects or circumstances themselves.

This is in fact the conditioned reaction in one of its earliest forms. The fact that words can induce not only reactions of the striated muscle, in the form of voluntary conduct, but can also provoke striking reflex, vaso-motor, and secretory changes similar to those produced by the original stimuli which the words denote, was known ages before Pawlow measured this tendency in the case of the digestive juices. The facts of the "conditioned reflex" are well known to every boy who owns a dog, as they were to the first savage who ever domesticated a beast of burden, or to the first man who employed gesture as a mode of communication.

There is indeed a sense in which this redin-

tegrative mechanism is representative of the most characteristic acts of perception and association. In space perception, in reading, in the recognition of familiar objects, in association by contiguity and similarity, in ordinary illusions, in many forms of æsthetic enjoyment, the essential mechanism is the redintegration of a previous total reaction by a present partial stimulus. In this field illusion is distinguished from correct perception only by the appropriateness or relevance of the stimulating detail. This is the same type of distinction as that which we shall find necessary to make between psychoneurotic and healthy conduct.

CHAPTER III

REDINTEGRATION IN THE PSYCHONEUROSES

Two things now remain to be done before this exposition of redintegration is complete. It must first be shown that the clinical symptoms of the psychoneurotic conform to this redintegrative pattern. It must then be shown how these tendencies in the psychoneurotic differ from the many similar redintegrative reactions which we have just described as normal, not pathological.

Observation of the psychoneuroses of soldiers in time of war exhibits in most striking fashion the operation of the redintegrative mechanism. In the trenches or in some other form of active engagement or service the soldier is overcome by anxiety, terror, rage, or deep depression. He collapses and is removed to the field hospital, to the base hospital, and, as he gradually recovers, to some convalescent camp farther removed from the scene of conflict. His breakdown may have been characterized by one or more of a great variety of symptoms—general somatic distress, weakness, nausea and vomiting, paralysis, deaf-

ness, tremor, tic or spasm, stuttering, convulsive attack, fainting spell, contracture, visual defect, headache. Or perhaps his picture takes a more psychic form, in states of worry, hypochondria, insomnia, timidity, nightmare, doubt, suspicion, anxiety.

Whatever the symptom, the first important thing is that it came as a reaction to a very complex situation, involving many or all of such varied details as weapons, orders, officers, drills, uniforms, shouts, explosions, combat, physical violence, ghastly sights and sounds, sudden and terrific noises, flashes of flame, disagreeable duties, responsible details, exposure, burdensome work, regimental discipline, distasteful food, restriction of liberty, absence from home, etc.

The next observation of importance is that he commonly recovers from the acute symptoms when removed from the stimulating environment. Release from service, being ordered to his home camp, being sent to non-combatant service, being assured that he will not be returned to the front, being granted a long furlough, or being informed that peace has been declared or an armistice signed, mean, with surprising certainty, relief from the acute symptoms.

The third observation which is of special rele-

vance from our point of view is that, pending such relief, or for some time afterward, the occurrence of a single detail of the original complex experience is sufficient to induce the complete symptom reaction again. The sudden discharge of the fire alarm at the convalescent hospital throws the recovered inmates back into their former tremors, agitations, aphonias, stammering, convulsions and nightmares. The unexpected popping of an automobile engine was observed to have a similar disastrous effect. Such men cannot carry on the drill exercises prescribed for them in many convalescent hospitals, since the "drill situation" itself is adequate to bring back their former symptoms. A sudden shout, a slap on the back, a parade, the excitement of a dog fight, a boxing match, the sight of a flesh wound, the call to an examination, being given a mental test, appearance before a board of medical officers, a typhoid inoculation, assignment to guard or police duty, or even the appearance, in the ward, of a medical officer in uniform, constitute exciting causes of a return of the old time tremor, stammer, paralysis, headache, nausea or fainting spell.

The concept of the psychoneuroses expounded by Roussy and Lhermitte ("The Psychoneuroses of War," Univ. of London Press, 1918), while

characterized by obscurity occasioned by their vague use of the word "unconscious," accords in certain respects with the concept here advocated. Thus:

The soldier, profoundly impressed by the conditions and often experiencing the most distressing visceral disturbances from the emotion, reacts, not always voluntarily, but driven by that instinct deeply rooted in us all—that of self-preservation. Shaken by a bursting shell, for example, or hit by bullet fire, the neuropathic subject has nevertheless the energy to escape from danger. Far from being glued to the spot, he shelters in a dug-out, a shell-hole, or a trench. It is when removed to calmer surroundings, far away from danger, that the psychoneuropathic condition comes to light, whether as a contracture, a paralysis, a tremor, or a convulsive fit. This is easily understood if we bear in mind that from the moment when all danger is passed, the instinct of self-preservation loses all its inhibiting influence over the emotional phenomena. The latter outlasts the initial emotion, or more often, perhaps, the emotion is brought back to the mind of the patient, bringing with it the various recognized motor and visceral disturbances. Thus we reach the third act of the series: the *fixation and realization of the emotional reaction.* In one case this will appear as a tremor, in another as a paralysis, in others as a contracture, mutism, or delirium. Fixation of the emotional reaction is a true characteristic of the psychoneuropathic condition (pages xxviii-xxix).

Psychoneuropathic tachycardia, like tachypnœa, is characterized by its occurrence in *paroxysmal attacks, which are brought on by the revival of an emotion.*

The cardiac disturbance is not usually the only feature shown, the patient at the same time exhibiting other psychoneuropathic manifestations—paralysis or contracture, disorders of the gait, stuttering, etc. The attack of the tachycardia is brought on by the remembrance of a previous emotional state. This recollection may be brought about by medical inquiry—a common occurrence, though its connection with the recrudescence of the emotion is not quite clear; or by some perception which is somehow connected with the idea of the battle (page 110).

The special feature of the psychical condition of patients suffering from these psychopathic disorders (delirium and excitement) is that between the bouts of excitement no real mental confusion is detected. The patient can speak and reply to questions with great ease. But if one reminds him of some episode in the fight or brings back some recollection or idea associated with it, he is at once overcome by emotion; he again pictures the scene he has lived through, sees "Boches," throws himself under the bed to shelter from the shells, or runs ahead towards imaginary trenches. The thud of a distant cannon or some metallic noise will often be sufficient to provoke an emotional attack with all the phenomena of oneiric delirium. In such cases the psychological state is characterized by the suddenness of the emotional reactions and their short duration, the absence of systematization of the emotion and of any dominant delusion and, lastly, by the complete integrity of the intellectual processes in their strict sense. They are purely psychoneuropathic disorders, analogous to paralysis, contracture and mutism, and as such they recover rapidly, never leaving any sequelæ whatever.

There remains only the constitutional condition of emotivity, owing to which the hypnosis of battle and the hystero-emotional psychoses can be produced. Thus we consider that the postemotional or postconcussion form of mental confusion should be ranged in the same class of psychoneuroses as the motor disorders and the affections of the senses and sensation, since they both have the same etiology, the same psychopathological basis, the same prognosis, and demand the same method of treatment (pages 128, 129).

Although its scope is difficult to define with accuracy, it is quite certain that a *neuropathic constitution,* hereditary or acquired, is a potent factor in the causation of these disorders. . . . This psychoneuropathic constitution of which we are speaking seems, if not the most commonplace, at any rate the most frequent. It may reveal itself by two modes of expression: those of an *emotional nature,* an exaggerated expression of the psychical and physical reactions of the emotions, and those of a *hysterical nature,* the essential characteristic of which is the faculty of *dissociation of the psychical functions* and the *prolonged "fixation" of the disturbance of a function* (pages 152, 153).

In the above accounts we have explicit illustrations of the redintegrative mechanism. There is the original complex reaction to a situation. This reaction becomes "fixated," that is, it is in some way consolidated and subsequently likely to recur in total form. The recurrence is brought about by any detail of the original situation. The symp-

tom itself consists in the recollection of this previously excited reaction, with such sensory, motor, or central features most prominent as were conspicuous in the original emotional expression. It is true that Roussy and Lhermitte do not perceive the essential simplicity of this mechanism, and are impelled to introduce what seems to be a "pure emotion" between the stimulus and the reaction, of which "remembered emotional state" the symptom is the expression. It is also true that the authors are impelled to explain the clear redintegration of the previous reaction by assuming its "perseveration" in the unconscious.

Thus becoming fixed in the mind, the emotional attitude tends to escape from conscious control and to reach the depths of the unconscious. This generally occurs rapidly, and the objective symptoms of emotional origin are the more deeply rooted the older their inception. It is precisely this progressive delay in the realms of the subconscious and then of the unconscious mind that accounts for the fact that psychoneuropathic symptoms are the more tenacious the older their origin. It is only by a voluntary effort that the patient can recall the emotional origin of the neuropathic condition; but he is very often quite incapable of making this effort, and this for many reasons. The instinct of self-preservation which, at the moment of the shock, restrains the abundant emotional reactions and checks the development of psychoneuropathic manifestations, changes its rôle, so

to speak, and becomes an effective cause of fixation and of the persistence of the emotional attitude (page xxix).

These speculative assumptions are of course entirely gratuitous. All that is necessary is to recognize the tendency of these individuals to respond as they have previously responded, and to give the total reaction to fragmentary details of the original exciting situation. This is the mechanism of redintegration.

DeFursac describes this mechanism as characteristic of the psychoneurotic soldier, although he is far from realizing the far-reaching significance of his own remarks, when he writes:

But it is mainly the recollection of impressions related to the war that has the particular potency of exciting emotional crises. A shot fired in the distance, the sight of an airplane, a simple conversation about the war, suffice to let loose manifestations of anxiety. One of my patients said 'You must speak to my face, otherwise it frightens me.'—Another, upon hearing several cannon shots, though fired at a great distance, was seized with such trembling that he had to be put to bed.—— A morbid imagination stirs up, amplifies immeasurably and converts into obsession tragic spectacles of the war, causes him to live over again the fears once experienced, and projects into the future the terrors of the past.—— The subject sees himself on the way back to the trenches and owing to an emotional and imaginative erethism, this perspective revives the elements of the shell shock

syndrome. (DeFursac, "Traumatic and Emotional Psychoses," *Am. Journal Insan.*, July, 1918.)

The mechanism here is especially clear, and it is entirely inadequate to characterize these cases as malingerers or simulators. If the redintegrative mechanism is relied on to make men thrill at the drum beat, the bugle call and the sight of the flag, it should certainly be recognized as adequate also to make them tremble at the sound of cannon, go speechless again at the prospect of bayonet practice, and nauseated again at the sight of a surgeon's knife.

In civil life the common psychoneurotic pictures are equally amenable to description under the terms of the redintegrative mechanism. Thus an adult patient is described as having attended the opera on one occasion after a bilious attack. "On looking over the balcony he became so dizzy that he presently had to leave. The week after, this time not bilious, he attended the opera again, and, looking over the balcony suddenly became dizzy again, and felt so uncomfortable that he could not sit through the performance. This state of affairs became so permanent that he finally had to give up the very desirable seat in the balcony" (Haberman, "Probing the Mind," Med. Rec., Dec.

1, 1917). The case is adequately described by saying that the single detail (sitting in the balcony) reinstated the total reaction that had previously been made to the more complex situation of being bilious, upset, sitting in the front seat at the opera, in the balcony, and peering over the railing. In a still more exaggerated form simply "going to the opera" or "hearing an opera air on the phonograph" might reinstate the same complete symptom picture.

Another case is described by Haberman as follows: "A neurotic patient was brought to me because of persistent vomiting spells, at first but occasional, later very frequent. She had been 'pumped,' lavaged, dieted, physicked, and treated with innumerable drugs. Nothing had helped. My analysis brought out the fact that the parents of the girl had wished her to marry a certain man who was physically offensive to her. The girl objected and the parents persisted. There were arguments, quarrels, scenes. The man was disgusting to her. One night he called and the girl felt nauseated. After he left she vomited. Expecting him the following evening, she vomited before he came. Thereafter she had vomiting spells every time the man was expected or called. Even thinking about him brought on the attacks."

Here the psychoanalyst imbued with any of the concepts of symbolism, transfer of libido, siphoning of affect, or infantile regression, would find rich material for the elaboration of metaphors and similes. Haberman's own account is much more straightforward and cogent. "A psychoreflex had been established through the vegetative nervous system with the stomach, and every mental association linking in this man brought on an upheaval" (Med. Rec., Dec. 1, 1917). But the redintegrative mechanism still more aptly sums up the picture. The vomiting reaction had previously followed upon a very complex stimulus—quarrelsome session with parents, conflicting emotions, the sight of the man, his loathsome physical characteristics, resistance to his approaches, etc. Thereafter the mere thought of the man, the expectation of a visit from him, even his name, sufficed to bring on the complex vomiting reaction. The partial stimulus redintegrated the total response.

Another case, otherwise normal, confesses to a strong aversion to ice-cream, which was formerly enjoyed. The aversion dates from a remembered occasion when the presence of a hair in a dish of ice cream, discovered too late for avoidance, brought about an embarrassing situation and a

violent organic revulsion. This organic revulsion, in the attenuated form of a positive aversion, is now reinstated by a minor part of the original stimulus—the sight or taste of ice cream.

A case described by Prince and cited by Wells (*Mental Adjustments,* page 128) had a phobia for towers and church steeples, especially those in which bells might ring.

No associations to explain the anomalous emotion were present to ordinary awareness. Memories elicited under hypnotic conditions threw no light on its origin. It was finally determined through the medium of automatic writing. While the patient was under hypnosis, narrating some irrelevant memories of her mother, her hand, into which a pencil had been put, wrote rapidly: "G— M— church and my father, took my mother to Bi— where she died, and we went to Br— and they cut my mother. I prayed and cried all the time that she would live, and the church bells were always ringing and I hated them." She wept while writing, but did not know why, nor what her hand had written. After coming out of the hypnosis, the patient was questioned as to the events referred to in the writing. A clear account of them was given, not accompanied by emotion, nor in the childish phraseology of the writing. Her mother, who was seriously ill, was taken to a great surgeon to be operated upon. . . . The chimes in the tower of the church, which was close to the hotel, sounded every quarter hour; they got on her (the daughter's) nerves; she hated them; she could not bear to

hear them; and while she was praying they added to her anguish. Ever since this time the ringing of bells has continued to cause a feeling of anguish.

No clearer illustration of the redintegrative mechanism could have been devised. Here the original total response, an emotional condition, is totally reinstated by the recurrence of a very fragmentary detail of the original stimulus—the sight of a church steeple or the sound of a bell —these being the only portions of the original setting that were at all likely to be encountered in the new environment.

Wells, under the heading of "affective symbolism," cites another case which is readily describable in terms of the redintegrative process, without invoking so special a mechanism as the "siphoning of affects." This is "the case of a twelve-year-old girl, characterized by an excessive dislike for the ordinary housework she is called upon to perform. She does not mind setting the table, making beds, watering flowers, or running errands, so much as dusting, cleaning the bird cage, and the like; that is, especially things that have to do with house-cleaning. The most distasteful thing for her is to 'cut off the stems of flowers because their sap tubes are plugged.' In

the midst of the embarassment ensuing upon this confession, the girl appreciates an analogy between these dislikes and her chronic constipation from the earliest childhood, resisting all medical treatment. The housecleaning served in its unpleasantness as the affective symbol of its bodily correlate'' (*Mental Adjustments,* page 146).

The concepts of ''affective symbolism'' and ''affective siphoning'' with their indefinite implication of motivation, may have advantages in psychotherapy which justify their retention. But for purposes of insight and description the essential mechanism here exhibited is simply that of redintegration—a trivial relational identity in the two situations, housecleaning and constipation, is sufficient to reinstate the loathing that originally belonged to the much more complex situation constituted by her lifelong illness.

One more case of this general type may be given by way of further illustration, a case described by Dejerine and Gauckler (*Psychoneuroses and Psychotherapy,* page 4):

> A woman, fifty years of age, who has been a widow for several months. Her children live at some distance from her and are not of much comfort to her. Her whole life was wrapped up in her husband, now several months dead. She is extremely thin. She weighs 79

pounds instead of her normal weight which is in the neighborhood of 110 pounds. This loss of weight has been rapid. It has taken place in three months. She says she is actually incapable of eating. Her food sticks in her throat. She chews it indefinitely, and cannot get up courage to swallow it. An egg, two or three cups of milk, and a few mouthfuls of bread are her daily diet. It is the typical picture of *mental anorexia.* How did it start? Here is a case which is purely emotional in its origin, and this is how it happened. The woman continued to occupy the apartment where she had lived with her husband. When she sat down to her meals his image would arise before her, as would be natural from the association of ideas, bringing a whole train of emotional sensations, constriction of the throat, a feeling of weight in the stomach, lack of appetite, etc. She would get up from the table without having really eaten anything. By degrees this restriction of diet which was purely emotional in its origin brought her to the condition of mental anorexia.

The assumption here made of the revival of the image through the mechanism of association is purely gratuitous. It is enough to recognize that here was a situation (sitting at the table) which had previously been part of a larger whole (the first occasion of trying to eat after her husband's death, with his empty place conspicuous, his body perhaps in an adjoining room, the odor of medicines, the darkened house, the presence of lamenting relatives, the business of the undertaker,

the priest, the nurse, etc.). In this elaborate situation her pronounced emotional reaction prohibited eating, characterized as it was by "emotional sensations, constriction of the throat, feeling of weight in the stomach, lack of appetite, etc." Since then, a part of the original situation, namely, the act of sitting at the table to eat, reinstates the whole emotional situation. Any part of the original situation would probably be equally effective—but these other parts do not recur—the relatives have departed and seldom visit her, the body is gone, the undertaker never returns, the house is no longer darkened in daylight. It is entirely unnecessary to assume with Dejerine and Gauckler that the idea of the husband was present in imaginal form, or indeed in any conscious form whatever. What is present is a fragment of the stimulus, evoking the total reaction.

The picture of the neurotic pedant presented in Jensen's story "Gradiva," is that of a man distressed by a proneness to redintegrative responses on the autonomic level. Numerous things, in themselves apparently unrelated and trivial details, provoke in him vague emotions of unrest and interest, tinged with curiosity and desire. This is the whole of his neurosis, except for occasional periods of confusion and a dissociated make-up

which occasionally leads to absent-minded acts and "wanderings."

The potent details are such things as the pose of a female figure in an antique bas-relief, the peculiar gait of an unrecognized woman on the street, the warbling of a canary in an open window of a house in the neighborhood, a pair of honeymoon travelers, the conversation of a loving couple, the mating activities of house flies, an asphodel cluster of white bell-flowers, etc.

All these details, it develops, may be related to an early girl playmate for whom he had developed an early fondness that had been interrupted by the zeal of his parents. These adults had insistently directed his boyish activities into archæology, in order that the father's fame as an antiquarian be preserved and perchance exalted.

Fortunately for the young man's domestic life, the girl in the case required no psychoanalytic instruction to enable her to see the obvious character of his symptoms. In a severe lecture, from which a pouring rain prevented his escape, she effected a complete cortical redintegration, reassociated these potent details into their original setting of which she was herself the center. "See, all that means only that you love me." And the "cure" was completed.

The author of the Introduction to Freud's "Delusion and Dream" is quite right when he says "it needed only the application of technical terms to make this romance . . . a pretty good key to the whole domain of psychoanalysis." We may add, moreover, that the mechanism of redintegrative response constitutes a satisfactory key, both to a knowledge of the mental make-up of the hero and to an understanding of the actual facts indicated by the "technical terms."

The importance of the redintegrative mechanism in hysteria is recognized, although inadequately developed, by Bleuler, who writes, "Some hysterical phenomena represent mere *association reflexes*. If tuberculin injections have been followed by fever, distilled water can have the same effect, providing the patient thinks it is tuberculin. Whooping cough paroxysms may attend all situations associated with coughing, long after recovery from the original illness. Such a permanent association may result from a single experience, as a result of a definite constellation. If a hysterical pain occurs when the patient is lying in the grass, it may be reproduced thereafter by the wet grass, without the repetition of the actual cause" (*Lehrbuch der Psychiatrie* [2d ed.], 1918, page 405). A similar mechanism is strongly sug-

gested by the familiar symptoms occurring in hay fever and asthma, as for example a case in which a person subject to hay fever in the presence of roses, had a typical attack when confronted with a bouquet made of paper.

CHAPTER IV

NORMAL AND ABNORMAL REDINTEGRATION

If the above array of examples is at all representative of the reaction type of the psychoneurotic, it is clear that the mechanism of redintegrative response affords at least a descriptive characterization of these clinical conditions. But, as we have already pointed out, ordinary perception is also largely a process of reacting to "cues" in the same way as if the "wholes" were present. The learning process represents a similar result—the child learns to react to the sight of the candle flame in the way in which he previously reacted to the total situation of seeing the flame, reaching for it, and experiencing the pain of the burn. Language also is based on the disposition to react to a part of a total experience instead of requiring the presence of the whole. This is the way in which a word comes to have *meaning.* This is the origin of the *concept.* Such a process is in fact the essence of *symbolism,* and symbolism in all its forms seems to be nothing more than this. The origin of trade symbols shows very clearly this

tendency to substitute the part for the whole—the horns for the steer, the colored bottles for the prescription case, the red stripes for the bloody operation.

But special attention must be given to occasions in which perception is *faulty;* on such occasions misdirected reaction, illusion and misunderstanding result. Such error is commonly due to one or another of several mistakes. In some cases the reaction is simply premature—that is, the cue that is acted upon is too slight, inadequate, too fragmentary. The total reaction which it then provokes may be quite inappropriate to the actual setting in which the cue occurs. This produces illusion in the field of perception, blunders in the learning process, mistaken inference in the field of language and conduct. Such conditions are produced by the impetuous nervous system, reacting prematurely to the insufficiently developed stimuli. It characterizes the flighty or hypomanic type of personality.

Again, there is the type of perceptual defect characterized by the inability to comprehend *wholes* or complex situations. Such an individual establishes all his reactions to one or another minor detail of his momentary experience, being unable to apprehend the relational elements, the

pattern aspect, the contextual features, which stimuli present. Such a condition is that of the mental defective, the feeble-minded, who, in the lowest degree of competence, react almost solely to the simple sensory qualities rather than to the perceptual, relational, and meaningful aspects of their experience.

A third type of defect is represented by the undue perseveration and insistent readiness of a particular pattern, leading to the relative exclusion and inhibition of other patterns. On the cortical level this undue perseveration of particular redintegrative patterns is found in paranoid attitudes and delusions, in stereotypy, speech mannerism, and a conspicuous limitation of the range of associative reactions. On the postural level it is found in obstinate postures, catatonic fixations, motor automatisms and introverted attentive adjustments. On the autonomic level it is shown by various pictures characterized chiefly by chronic emotional exaggerations, persistent moods of depression or elation, hypochondriacal interests, apathy and dejection. Clinically this defect accords with the descriptions of dementia præcox in its various forms and with many of the conditions related to manic-depressive psychoses.

A fourth type of defect is represented by the

tendency to respond, not so much to an insufficient detail, but rather to an irrelevant but outstanding detail, and to this detail in its own character or in its earlier setting, rather than as determined by the nature of the present context. This failure to apprehend the proper significance of the various details of an experience, and to react in the total fashion to the appearance of an irrelevant item or feature, is a defect not so much in intelligence as in sagacity. The term "sagacity" has been most aptly utilized by James to describe what he calls the "perception of essence"—"the ability to extract characters—not *any* characters, but the right characters." Along with *learning,* which he defines as "the ability to recall promptly, consequences, concomitants, or implications," sagacity is for James one of the important aspects of reasoning (*Prin. of Psych. II,* page 331). This is the same distinction made by John Locke, about two hundred and fifty years ago, when in his "Essay Concerning Human Understanding" he wrote of the "difference of wit and judgment."

> If in having our ideas in the memory ready at hand consists quickness of parts; in this of having them unconfused, and being able to distinguish nicely one thing from another where there is but the least difference, consists in a great measure the exactness of judg-

ment and clearness of reason which is to be observed in one man above another. . . . For, wit lying most in the assemblage of ideas, and putting those together with quickness and variety wherein can be found any resemblance or congruity, thereby to make up pleasant pictures and agreeable visions in the fancy; judgment, on the contrary, lies quite on the other side, in separating carefully one from another ideas wherein can be found the least difference, thereby to avoid being misled by similitude and by affinity to take one thing for another.

Sagacity is, then, the ability to comprehend properly the part in its relation to the whole and to discriminate out of a whole the appropriate, relevant, or significant detail. Failure in sagacity will thus imply a disposition to react to a present total situation by singling out *some* detail of it and reacting to this detail by *some* total reaction previously associated with a whole in which the detail figured as an item. This is the mechanism of the psychoneuroses. If we may accept the analysis of James, whereby reasoning or intelligence involves the two essential features of *sagacity* and *learning*, it is not unfair to suggest that just as the feeble-minded are conspicuously lacking in the latter function, the psychoneurotic are deficient in the former.

Because of this lack of sagacity, the psychoneurotic becomes dizzy on hearing an opera air,

vomits at the mention of a man's name, is sickened at the sight of a flower stem, is fearful and anxious in the presence of a church tower, displays mental anorexia on the sight of a loved one's place at table, stammers again at the appearance of a medical examiner, is thrown into violent tremor at the sound of the fire alarm, and reestablishes a paralysis or contracture when ordered to bayonet practice or to fatigue duty.

From the point of view of reaction type we have, then, five different conditions here described, all of them to be conceived as in the main constitutional. They are as follows:

a. The *normal* type, in which the reaction is made to the part in the light of its contextual relations. On subsequent occasion only those parts which, in the light of the whole, have established relevance, are potent to discharge the total reaction—to act as cues.

b. The *hypomanic* type which is characterized by a disposition to react prematurely to details that are insufficiently developed to reveal their present relevance.

c. The *feeble-minded* type, in which ability to comprehend total situations and the relational or contextual features of details is wanting or is inadequate, hence all reactions tend to be on a rela-

tively low level of complexity, directed toward the simple sensory qualities or the more rudimentary perceptual features of experience, only. Abstract relations, social situations, conceptual characters and inferential propositions fail to constitute potent stimuli because they are not apprehended.

d. The "dementia præcox" type, characterized by the undue perseveration and insistent readiness of a particular system or redintegrative pattern with the resulting predisposition toward fixed and stereotyped response, systematic delusion, postural automatism and emotional inflexibility.

e. Contrasting with these pictures is the *psychoneurotic,* with disposition to give the total reactions of previous experience in response to the fragmentary details of the present. Some outstanding portion of the present experience is prepotent in determining the reaction, and the reaction given is characteristically a complex response, previously made to a total situation in which the present detail figured as an item. This is the redintegrative mechanism. This is deficient sagacity.

Conceived in this fashion, hysteria, for example, is more than the particular and acute set of symp-

toms manifested at a given time. The removal of the specific symptoms is no more a cure of the hysteria than is the application of conduction-anæsthesia a cure for toothache. The constitutional disposition remains when the particular reactions have ceased. No more is the feeble-minded cured when he has established a set of specific habits toward a complex whole, the true structure of which he is still unable to comprehend. The popular use of the term "cured" in connection with these conditions can represent only one or more of four things—ignorance of the facts, verbal wish-fulfillment, smug professional pretense, or mere symptomatic relief.

If it be now asked why some individuals show stronger inclination toward the redintegrative type of response to outstanding but irrelevant details, it is perhaps most pertinent to point out that the same question should be asked of those whose descriptions of the psychoneurotic picture are in terms of symbolism, transfer, free-floating affect, conversion of libido, pithiatism, etc. In such cases no clear basis of individual differences, and hence no adequate etiological account is forthcoming. Hence even if we could offer no satisfactory reply concerning the causes of individual differences, the redintegrative mechanism would be in no greater

predicament than are the other explanatory concepts.

It is, however, quite possible to give at least a suggestive account of the neurological basis of these constitutional dispositions. The normal nervous system is so organized and integrated that activity in any one arc or on any one level is definitely under the influence of determining tendencies and action patterns operating in the system as a whole, and in its various parts. The response to one detail of a situation is thus conditioned by the relevance of this item to the context, to the total experience. In the hypomanic nervous system a general lowering of thresholds *within* the particular arcs or levels contrasts with a relatively higher range of thresholds *between* these fields, hence the tendency for the various details of an experience to set off independent, premature and flighty responses, unrelated either to each other or to any more general determining tendency or pattern. In the nervous system of the mentally feeble, the structures involved in the integration of more elaborate patterns are wanting or fail to function. Determining tendencies of the relational type are unattainable, and the only possible responses are to the rudimentary details, the sensory qualities, and the simpler perceptual

units. Hence the individual's responses to complex stimuli are likely simply to fail or fall short, rather than to be perverted by the intrusion of reactions attached to other contexts.

The nervous system of the psychoneurotic, then, will be characterized by relatively successful organization of complex arcs and levels, but there will be a marked tendency for this system to respond always by total reaction patterns, to prepotent but often irrelevant details of a new situation. The fault is not so much in the hastiness of responses, as in the hypomanic, nor in the simplicity of response and cue, as in the feeble-minded, but rather lies in the disposition to react in redintegrative fashion to prepotent or outstanding items which are not always relevant to the present context or to the present experience as a whole. Faulty sagacity, rather than faulty learning, to use James's terms, is at the bottom of the difficulty. A marked tendency to dissociative activity or a pronounced insufficiency of "nervous energy," both of them old concepts in this field, and given special importance by Janet, are not without suggestive value here.

Among other outstanding characteristics of the psychoneurotic make-up is the lack of a sense of humor—an inability to "see the point." Seeing

the point involves especially the capacity to appreciate the detail in its relation to the whole, the context—it requires that one be able to "put things together" into the appropriate whole, and to react to this whole rather than to the isolated though perhaps outstanding detail. The near-neurotic wishes, for example, to be famous, and seeks to attain greatness by emulation of the successful personages of his acquaintance. But the imitation is characteristically of some insignificant but outstanding detail—the habit of incessant smoking, the cultivation of a goatee or side-burns, the habit of taking midnight walks, or working late at night with a coffee-pot brewing close at hand, affecting some copied idiosyncrasy of dress, speech or manner, or resorting to the university attended by the emulated hero.

Interesting light is thrown on the conditions underlying these redintegrative reactions by Lashley's experiments with the conditioned salivary reflex in the human being. In the case of the dog it is relatively easy to establish this reflex in connection with some incidentally introduced stimulus. Any element of the total experience readily comes to provoke the complete digestive response. Undoubtedly the dog secretes saliva at the sight of the experimenter, at the opening of the door,

and at almost any constant detail of the food-getting situation which he has not, as a matter of probability, at all discriminated into relevant and irrelevant items.

The human being, on the other hand, does not readily exercise the salivary reflex unless the total situation is presented. Lashley remarks that the only effective stimulus to this reflex in the human being is a complex perceptual one—"the knowledge of a solid object held between the teeth." Simple pressure is not an effective stimulus. The human being, that is to say, reacts only to the *meaning,* to the total pattern or situation, to the detail plus its context, whereas the dog reacts to the simple elements, the sensory qualities.

For a human being to show the conditioned reflex readily in this case may then imply a failure of perceptual synthesis, a sort of dissociation or weakness of integration. He then resembles the dog, and may be said to be psychoneurotic. This is at least a suggestion that could be put to experimental test by those working in this field Thus Prince's patient reacted, by fear, to an elementary portion of earlier experience, rather than to its whole—to "steeple," rather than to "death of mother in foreign land, while I prayed frantically for her recovery, in my room near the

church, where the bells in the tower kept ringing in a manner which only increased my anxiety."

In just this way the child gives the verbal response, a name, to the whisker element, and all bearded men become "papa." And this is the method of primitive magic—the virtue is attributed to some insignificant fragment of the process, as in the ministrations of the medicine man, the "practical nurse" of the small town, and in the dogmas of the fakir in most of his dealings with human nature. The whole series, the dog's salivary flow, the infant's learning, primitive reasoning, and the psychopathic phobia, represent a failure to "get the point"—a lack of *sagacity,* an unhealthy disposition toward the redintegrative response.

It is at this point that the possibility of genuine and permanent therapy comes into question. We "cure" the infant and the savage by encouraging growth and education. We "cure" the drowsy and the exhausted, who show these same dispositions, by sleep, rest, recreation and food. But the adult hysteric is beyond the beneficent effect of growth, and the possibilities of changing constitutional nervous make-up through sleep, rest and diet are limited in the extreme. Aside from such immediate relief as may be afforded

by symptomatic treatment directed toward the particular and local complaint, the only therapeutic hope would seem to lie in intensive reëducation. And the limits of reëducation, even under the self-sacrificing, costly and time-consuming individual care of the most patient and discerning expert, are very narrow. Such treatment, if carried to completion, usually means the virtual sacrifice of one life for another, for a considerable period of time. It does not lend itself to the wholesale or institutional method, any more than to the devices of absent treatment.

CHAPTER V

LEVELS OF REDINTEGRATIVE RESPONSE

Another distinction may be drawn, on the basis of the nature of the response pattern and the general divisions of the nervous system involved therein. Three types of response may be discriminated in the reaction to a given stimulus or situation. On the postural or cerebello-spinal level there are the adjustments involving the spinal reflexes, the adaptations of the sense organs, and the automatic, habitual or voluntary changes in the peripheral musculature, all those acts which comprise the overt and externally recognizable attitudes and behavior of the organism as a physical object.

On another level, but still relating to the central nervous system, are those cortical adjustments which are traditionally described as the basis of ideas, images, memories, thoughts, and, in general, the cognitive aspect of consciousness. Perhaps in most cases should be included also the innervations or tension changes in the speech organs and such tentative, incipient, or gestural

movements of eyes, head and extremities as may be concerned in the awareness of meaning and the representation of objects not directly present to perception.

On a still different plane, this time not involving so directly the central nervous system, are the organic, visceral, vaso-motor, sphincter, and glandular processes, and the changes of muscle tone. These are presumably to be related in large part to the activity of the autonomic or sympathetic system, lying for the most part outside of the central nervous system, although being directly connected with it and in the main at least excited by or through it.

Perhaps a further distinction is to be made between redintegration and the case in which the detail brings to consciousness a train of specific associates and memory pictures, to each of which or to the total of which some reaction is made in emotion or in conduct. This latter experience is a genuine thought process, not a redintegrative reaction. Thus the lock of hair, the discarded garment, or the tombstone may bring to explicit recollection the person concerned, the acts of loving kindness or courageous conduct attributable thereto, the memory of specific suffering and sacrifice, with a resulting complex emotion. This

is not the redintegrative mechanism. It is reflective appreciation of meaning, the fragmentary detail of the original stimulus being entirely relevant. In such a case the reagent can give a coherent account of the grounds of his behavior and his reactions do not constitute neurotic symptoms. Therapy, if such it may be called, consists in avoidance of the stimulus since the reagent has complete insight into his own behavior.

The Freudian account will of course posit such a positive constellation under all circumstances, this constellation existing however as unconscious remnants of experiences long submerged. A special merit of the redintegrative concept is to be found in the ease with which it dispenses with this elaborate fiction of the efficacious unconscious. Therapeutic attempts would presumably proceed with equal success on either hypothesis. The one hypothesis, however, flagrantly and naïvely ignores the familiar canons of demonstration and proof, while the other seeks to articulate itself in an intelligible fashion with the ordinary psychology of the accessible.

When, for example, the neurotic soldier hears the exhaust of an automobile there are or may be reactions on all three levels. His peripheral musculature is obviously affected. On this level he

abruptly ceases the work in which he was engaged, crouches or stands erect, turns his head, changes his facial expression, runs or trembles, or falls to the ground or stammers. On the second level he may recall in the form of imagery, thought, or suppressed articulation, memories of the battle-field and experiences there endured. On the autonomic or emotional level there may ensue a widespread organic commotion, those tonic, visceral and vaso-motor adjustments of the unstriped musculature and glands associated with fear or dread.

Similarly in listening to an orchestra, or to the eloquent plea of an orator, or on looking at a waterfall or a landscape, there are the postural attitudes, the train of ideas, and the affective response which comprises the æsthetic emotion.

Redintegration, through the crystallization or fixation of response patterns, may occur on any of these planes. If it occurs mainly on the cortical level, this constitutes the normal act of perception, the conscious recognition of meaning, and the association of ideas. This is what makes possible thought in the ordinary sense. Dependent on the nature of the cortical processes, when thus elaborated, the individual may subsequently adjust his posture or the autonomic system may be centrally affected. The value of this cortical re-

sponse will be determined by the sagacity with which the stimuli are discriminated. Very often the cortical response represents the whole reaction, or the most conspicuous part of it. Thus if one hears an unusual noise but at once knows that it is "only the rattling of a window shutter," that is, by a cortical redintegration establishes it in its cognitive setting or context—one does not feel alarm, or curiosity, or worry, or fear. If the beginning of a story, heard before, cortically redintegrates the previous experience, the point of the joke is anticipated, and the explosive mirth reaction is reduced or fails entirely. The thinking of children and of savages is then not strictly psychoneurotic, since it takes place on the cortical level. It however closely resembles psychoneurotic behavior because of the lack of sagacity which is characteristic of both.

On the postural level, fixation of an attitude, a contortion, a tremor, a spastic or convulsive state of the diaphragm, limbs or sense organs constitutes what has been called *conversion hysteria.* The symptoms here consist of redintegrated portions of the peripheral musculature. Here belong the hysteric paralysis, the anæsthesias, the convulsive attack, aphonia, stammering, etc. It does not, of course, follow that *all* postural redintegra-

tion is psychoneurotic. Much of our ordinary life of habit and motor adjustment seems to be of this form. It is when the redintegrative process is not determined by a sagacious discrimination of relevant from irrelevant details that we more commonly call the behavior psychoneurotic.

On the autonomic level the various patterns of reaction, with their numerous degrees of complexity and intensity, comprise the essential basis of emotional consciousness. Redintegration of a response pattern on this level produces a total emotional state in response to a fragmentary detail of some earlier situation. Emotions, as James pointed out, are properly reactions to situations rather than to simple sensory stimuli. It is not the retinal image of the bear that properly arouses fear. The emotional reaction is determined by the attendant circumstances and relations—such as whether the bear is dead or alive, in a cage or ranging wild, whether the witness is unarmed or is effectively protected. Now if the fragmentary stimulus arouses first a cortical redintegration, an autonomic response may be determined by this memory or thought process, and the essential feature of the psychoneurosis is missing. The patient is already aware of the cause of the reaction, the source of his emotion. If however the au-

tonomic response is directly redintegrated by the fragmentary stimulus, there ensues the characteristic picture of anxiety hysteria. The patient finds a fear, a worry or dread insistently and vigorously asserting its presence. He may merely complain of this experience and try to get rid of the feeling by medication, or other such means. In this case he represents the typical anxiety state. On the other hand, if there is an attempt to rationalize this experience of the fixated autonomic response, this leads to the pictures of melancholia, paranoia, or the compulsion neurosis, depending on the nature of the emotion and the other characteristics of the individual.

Since the autonomic responses are relatively slow, as compared with reactions of the central nervous system and its associated organs, the successful cortical redintegration usually implies a modification or an inhibition of the spinal or autonomic reactions so that they come to be made in the light of the completely redintegrated cortical whole, rather than to the perceptual detail taken by itself. Successful cortical redintegration consequently eliminates the psychoneurotic element. From this two things may be expected to follow.

First, discovery of the nature of the detail and

recognition of the context into which this detail originally fitted, results in the substitution of cortical for autonomic or postural redintegration, hence this is the most effective type of psychotherapy—the promotion of insight. It may be well, however, to point out that reaction patterns established and fixated on the redintegrative basis may thereafter persist as simple habits and automatisms. The contracture, the speech spasm, the tremor, the tic and numerous other symptoms, especially on the spinal level, may thus persist after the original cause is removed, and even in the absence of the detail which originally recalled them. It may be that the autonomic system also is liable to these tendencies to habit formation. Thus develop the chronic conditions, to be removed only by reëducation and exercise, rather than by motivation and psychotherapy. A similar fact is related by Babinski in connection with the *reflex* paralyses, etc., following upon traumatism in some other region. Originally reflex, they may be perpetuated as simple habits or automatisms.

The first point is then that psychoanalysis, confession, reëducation, exploration of vague memories, and similar methods thus find their justification without the assumption of the elaborate array

of fore-conscious, sub-conscious and other regions and mechanisms.

In the second place it might be expected that inadequate cortical redintegration might be a condition favoring redintegration on the autonomic and postural levels. A degree of mental inadequacy or stupidity and a lack of sagacity, would on this supposition afford the proper soil for psychoneurotic symptoms. I shall next show that this is the case and that psychoneurotic redintegration on spinal and autonomic levels, and especially on the former, which level is more directly under the control of the cortical level, is characteristic of individuals whose mental competence is just above that of the feeble-minded. Since the postural level is so readily brought under cortical control, adequate cortical redintegration might be expected to constitute an unfavorable condition for the development of conversion symptoms. Constitutional cortical inferiority (intellectual deficiency) on the other hand, might be expected to predispose the individual toward such symptoms.

But the responses of the autonomic system run a much more independent course. For one thing the connection of the autonomic system with the cortex is less direct than is that of the spinal sys-

tem. The effectors which it controls are in a large measure the so-called automatic and nonvoluntary systems of muscles and glands. Moreover, autonomic responses take, in certain circumstances, a form which results in the initiation of chemical processes. These, once set going, must run a certain course, which is not under the direct control of cortical action. It would be, then, entirely in accord with theoretical expectation to find autonomic redintegrations taking place in individuals of normal intelligence, characterized by adequate cortical integrity. Postural redintegration, on the other hand, as manifested in conversion symptoms, should theoretically lead one to suspect the presence of intellectual inadequacy. In a later chapter it will be shown that these are precisely the results derived from the intelligence measurements of psychoneurotic soldiers.

It is, in a sense, true that the psychoneurotic presents an infantile picture. But in the same sense it may be said that the picture is canine, savage, or hypnagogic. The infantilism is not that of the feeble-minded, although measurements of the mental status of the psychoneurotic show their intelligence to be distinctly inferior and of the "border line" degree. If we have been justified in distinguishing between sagacity and learn-

ing, the psychoneurotic's chief difficulty is in the former function, and he may in a given case be pitifully weak in sagacity, yet relatively competent in general alertness. On the whole, however, the trait of sagacity is undoubtedly a component of that more general characteristic which we commonly call intelligence, and mental measurements of psychoneurotic soldiers show very clearly that these cases are inferior to the average citizen. They occupy, in fact, that region of the frequency curve lying just below the average intelligence rating and just above the highest grade of the feeble-minded. They occupy the region of stupidity.

It is highly probable that the various "character defects" so commonly ascribed to the hysteric, —dependence, extreme suggestibility, naïveté, forgetfulness, credulity, deceitfulness, impulsiveness, volitional debility, etc.,—portray simply the humble intelligence of these patients, rather than the presence of a peculiar "hysteric make-up" or "neurotic constitution."

CHAPTER VI

THE INTELLIGENCE OF PSYCHONEUROTICS

General information concerning the intellectual status of psychoneurotic patients has heretofore not been available. Discussion of these conditions, from the point of view of their mental make-up, are numerous, but the more strictly intellectual characteristics are not usually given prominence in these discussions. Many of the accounts give most attention to the neurological or clinical features, the somatic symptoms, such as paralyses, contractures, anæsthesias, and convulsive attacks. Other accounts dwell in greater detail on the more strictly psychiatric features, the permanent mental disorders or mental stigmata, and the episodic mental aberrations which may either accompany the hysterical attacks or occur independently of them. Occasionally considerable attention is given to the moral disorders and the character defects of these patients. In more recent years there is a tendency to emphasize rather the psychogenesis of the patient's symptom picture, the mechan-

isms and motives involved in this development, and the technique of therapy.

Occasionally statements are found to the effect that the psychoneurotic, and particularly perhaps the hysteric, display a constitutional intellectual picture that is relatively inferior. These statements are not only rare, but in no instance with which the writer is acquainted is any evidence presented other than that of the incidental, anecdotal or impressionistic sort. There are of course sufficient reasons for these facts. In the first place the methods of intellectual measurement which make quantitative evidence possible have only recently been developed, postdating a great deal of the very voluminous literature on the psychoneuroses. In the second place, since it is not customary, in most parts of the world, to provide institutional treatment for these conditions (such as that provided for the epileptic, the insane and the mental defectives) there has been no ready means of access to the relatively large numbers of such patients required by experimental methods. Mental measurements of the insane, the epileptic and the feeble-minded, as well as of the delinquent and criminal classes have been relatively easy to secure, and consequently are numerous. Finally, even the individual access to such pa-

tients has been for the most part limited to medical men, whereas the methods of mental measurement have developed especially in the hands of psychologists.

Information concerning the actual intellectual status of individuals who develop the functional nervous disorders is very desirable, both from the point of view of theoretical insight and from that of practical treatment and diagnosis. In the case of the functional neuroses developing under the strain of warfare and general military service, it is fortunate that provisions were made for receiving at a central hospital those cases which did not make relatively speedy recovery. In the present instance this made possible the accumulation of intelligence ratings of nearly 1,200 psychoneurotic individuals. It is of course impossible to know precisely how many of these individuals would have developed psychoneuroses in the ordinary course of civil life, and hence it is impossible to know precisely to what degree these measurements reflect the mental status of the psychoneurotic in general. It is, however, true that the clinical pictures represented differ scarcely at all from those encountered in civil life, and also that in a large number of the cases the condition was judged as having existed prior to military experi-

TABLE I

MEDIAN SCORES OF DIAGNOSTIC GROUPS IN TESTS, GIVING IN EACH CASE THE MEDIAN, THE Q AND THE NUMBER OF CASES

	Mental Deficiency	Epilepsy	Hysteria	Neurasthenia	Psychoneurosis	Constitutional Psychopathy	Concussion	Psychasthenia	Cerebro-spinal Meningitis	
Completion	14.5	26.7	27.0	30.0	30.0	29.0	33.0	34.0	34.0	Median
	8.0	9.0	9.5	9.5	9.5	11.0	6.5	7.5	8.5	Q.
	43	233	144	56	108	37	37	12	13	Cases
Opposites	4.5	9.3	11.5	10.5	10.5	12.0	13.6	12.0		Median
	3.7	4.5	5.5	3.8	4.0	5.0	3.5	5.0		Q.
	38	177	123	44	85	34	35	11		Cases
Substitution	42.0	63.0	62.0	59.0	61.0	63.0	58.0	63.0		Median
	13.0	20.0	17.4	12.0	15.0	15.0	7.5	10.5		Q.
	31	205	135	52	92	29	38	11		Cases
Word Building	3.5	7.0	8.2	9.0	9.5	8.0	9.5	10.0		Median
	2.0	4.0	3.5	4.5	3.7	3.5	4.0	5.0		Q.
	40	202	136	49	110	36	38	10		Cases
Digit Span	4.0	5.7	5.8	6.2	5.8	5.0	5.8	6.0	6.5	Median
	.5	1.0	.5	1.0	.5	1.5	.5	.5	1.0	Q.
	47	163	124	47	90	31	38	11	23	Cases
Cube Imitation	4.7	6.5	6.3	6.5	6.3	6.5			7.5	Median
	1.0	1.5	.5	.5	1.0	2.0			1.0	Q.
	45	112	55	17	41	12			24	Cases

ence. It is also impossible to say with assurance to what degree the intellectual status of these cases represents that of all the individuals developing war neuroses, especially in the case of those whose recovery and return to duty was relatively prompt. Internal evidence afforded by the data here presented, however, suggests certain very plausible suppositions in this connection, as will be indicated at a later point.

TABLE II

MENTAL AGES OF DIFFERENT DIAGNOSTIC GROUPS

	Mental Deficiency	Epilepsy	Hysteria	Constitutional Psychopathy	Neurasthenia	Psychoneurosis	Concussion	Psychasthenia	Cerebro-Spinal Meningitis
Completion	8.5	11.5	11.7	12.3	12.5	12.5	13.3	13.5	13.5
Opposites	7.5	10.3	11.7	12.0	11.3	11.3	12.7	12.0	.....
Substitution	9.0	15.0	14.0	15.0	12.5	13.5	12.5	15.0	.....
Word Building	8.0	10.5	11.2	11.0	12.0	12.3	12.3	12.5	.....
Digit Span	8.0	10.0	12.0	13.0	14.0	12.0	12.0	13.0	15.0
Cube Imitation	7.0	12.0	11.0	12.0	12.0	11.0	.....	.....	17.0
Median of all but Completion	8.0	10.5	11.7	12.0	12.0	12.0	12.4	12.8	16.0
Completion	8.5	11.5	11.7	12.3	12.5	12.5	13.3	13.5	13.5
Median and Completion	8.3	11.0	11.7	12.2	12.3	12.3	12.9	13.2	14.8

Group Survey tests were administered to as many individuals as possible immediately after their arrival and comfortable location at the hospital. These tests comprised the Completion, Opposites, Substitution, Word Building and Digit Span tests. In addition the Cube Imitation test was given as an individual measurement to nearly every person who was examined individually. After the diagnoses had been made the cases were grouped according to the main functional diagnoses and the performance of each diagnostic group in each of these main tests was determined.

Table I gives for each diagnostic group the Median Score, the Semi-interquartile Range (Q), and the Number of Cases, for each of the six tests. The number of cases in each diagnostic group varies from a dozen in the case of Psychasthenia to 233 in the case of Epilepsy. In the case of the Group Tests the number of cases for each test representing a given diagnostic group are practically identical. In the case of Cube Imitation somewhat fewer cases occur in each group.

In Table II these Median Scores have been converted into Mental Age units. In the case of Completion (Trabue Scale A) the norms given by Trabue were used. In the case of Opposites and Word Building the norms given by Pyle and Pintner were averaged to afford the truest possible standards. In Substitution and Cube Imitation Pintner's norms were used. Pintner gives the norms for the Substitution Test in terms of time required for 50 correct responses. For our purpose, since the test was used by group procedure, with a time limit, the whole blank was used, and the norms given by Pintner were converted from a time score into a statement of number accomplished in two minutes, which was the time allowed. In the case of Digit Span, Terman's norms were followed, credit being given for the

highest age at which a given score is expected, two correct reproductions being required out of two trials, the number of digits ranging from 3 to 9. In determining the Mental Ages as based on these tests, the median of the five short tests is taken as half the measure. The Completion score is taken as the other half. The average of these two gives the final summary of Mental Age.

In general, as shown in Table II, a hierarchy of mental ages is shown, ranging from an age of 8.3 years in the case of Mental Deficiency to an age of over 13.0 years (13.2) in the case of Psychasthenia. The separate group of Cerebro-Spinal Meningitis residual conditions gives a mental age of nearly 15.0 years. The Epileptic and Hysteric groups both have a mental age of less than 12.0 years, the Constitutional Psychopathic, Neurasthenic and Psychoneurotic (not further specified) groups all stand very close to the 12.0 year level, while the Concussion group is characterized by a median mental age of almost 13.0 years (12.9). The general results from the examination of recruits show the average soldier to have a mental age of not over 14.0 years. It is clear that among these patients, all the presumably functional groups have a median intelligence rating that is inferior to that of the average soldier. Only the

Cerebro-Spinal Meningitis residual group shows a median mental age that equals or exceeds that of the average soldier.

TABLE III

MENTAL AGES OF DIFFERENT DIAGNOSES, DETERMINED EITHER BY GROUP SURVEY, STANFORD SCALE, PERFORMANCE TESTS, ALPHA TESTS, OR BY SOME COMBINATION OF THESE.

[Age	Frequencies												
	Mental Deficiency	Epilepsy	Hysteria	Constitutional Psychopathy	Neurasthenia	Psychoneurosis	Concussion	Psychasthenia	Cerebro-Spinal Meningitis	Organic Conditions	Psychoses	Undiagnosed	Totals
Failed.....	3	28	15	2	5	9	1	0	0	5	1	18	83
5– 6.....	2	1	2	0	0	0	0	0	0	0	0	2	7
6– 7.....	1	4	5	0	0	1	0	0	0	0	0	3	14
7– 8.....	6	12	10	2	1	8	2	0	0	0	0	9	50
8– 9.....	13	36	15	5	6	7	1	0	0	2	3	17	105
9–10.....	5	36	19	5	7	9	3	0	2	3	1	24	114
10–11.....	9	31	14	7	8	7	7	1	1	4	2	25	116
11–12.....	0	35	16	6	11	16	6	1	2	7	1	31	133
12–13.....	1	35	16	5	6	9	3	1	6	7	0	19	108
13–14.....	0	29	15	2	11	10	4	2	2	4	1	18	98
14–15.....	0	22	11	3	8	10	3	1	5	4	1	21	89
15–16.....	0	15	13	1	3	6	3	1	1	1	1	13	58
16–17.....	0	31	16	5	10	11	6	2	3	6	2	20	112
17–18.....	0	16	7	5	1	6	2	0	2	5	3	5	52
18–	0	8	3	0	6	5	0	1	2	1	0	7	33
Total.....	40	339	177	48	83	114	41	10	26	45	16	232	1172

In Table III is given the distribution of 1,172 cases, for Mental Age. In this Table all available cases are included. Along with ratings based on the Group Survey are included cases examined by the Alpha Tests, the Stanford Revision, the Scale of Performance Tests, and in some cases by

TABLE IV

MEDIAN MENTAL AGES OF DIFFERENT DIAGNOSTIC GROUPS

When tested either by Group Survey, Stanford, Performance, Alpha Tests, or some Combination of these

Diagnosis	Average	Median	Q	No. of Cases
Mental Deficiency....	9.0	8.6	1.5	40
Epilepsy.....	12.0	10.6	2.5	339
Hysteria.....	11.9	11.5	3.0	177
Constitutional Psychopathy.....	12.5	11.5	2.5	48
Psychoneurosis.....	12.6	12.0	3.0	114
Concussion.....	13.0	12.3	2.5	41
Neurasthenia.....	13.0	13.0	2.0	83
Psychasthenia.....	14.9	14.0	2.0	10
Undiagnosed.....		11.6	2.5	232
Organic Nervous Disease.....	14.0	12.3	3.0	45
Psychoses.....		12.5	3.5	16
Cerebrospinal Meningitis.....	14.6	14.0	1.5	26
Average.....		11.7	2.5	Total 1172

various combinations of these methods. This Table includes all cases for whom intelligence ratings

were secured. In the case of 232 of the patients no diagnosis was secured, these being mainly recent arrivals, who were not finally diagnosed at the time the writer left the service.

Two facts are apparent from Table III. In the first place the hierarchy of mental levels corresponds closely to that given in Table II. In Table IV the Medians, the Q's, and the Number of Cases are given for each group, including also several groups not representing functional conditions. The range, among the functional conditions, is from 8.6 years, in the case of Mental Deficiency to 14.0 years in the case of Psychasthenia. All except the Psychasthenic and the Cerebro-Spinal Meningitis groups are below the intelligence rating of the average soldier. The average mental age of the whole 1,172 cases is 11.7 years, nearly two and a half years below that of the average soldier.

The second fact disclosed in Table III is the striking bimodality of the distributions. There is a clear mode at 11-12 years and another, distinct but not so conspicuous, at 16-17 years.

The significance of this bimodality is far from obvious. It appears that the average soldier, who has a mental age of about 14 years, on current intelligence scales, does not come in large num-

bers to the hospital for functional war neuroses. Statistically the highest frequency among our patients should be at about the 14 year level, unless some selective agencies are at work. It is clear then that some such factors are operating. The soldiers who reach this country with chronic or extended functional nervous conditions are in the main either decidedly inferior to the average soldier in intelligence or else considerably superior to him.

Several explanations come to mind. It may be that only the low grade and the very high grade intelligences yield to these conditions, the former tending in the main to develop the conversion types of neuroses and the latter the anxiety types. On this hypothesis the stupid might be supposed to be cowardly and to adopt the obvious and gross mode of escape, the exaggeration and capitalization of physical infirmities, the development through suggestion of hysteric conditions or predisposition to postural redintegration. The relatively high grade also may be supposed to show fear through their clearer realization of the consequences of their action and perhaps through a more or less critical estimate of the method through which they have involuntarily been dragged into international relations. They are

predisposed to autonomic redintegration. The average intelligence then is neither brave nor cowardly but simply does as it is bid, and takes the consequences, without displaying redintegrative symptoms on either level.

On the other hand it is quite possible that the incidence of these functional conditions is general, but that the average intelligence makes prompt recovery and hence returns to duty, and does not show up at the hospitals for chronic cases. The greater frequency of the low grade and high grade cases would then mean simply that these two extremes failed to make prompt recovery, the one perhaps because of a high strung sensitiveness to the effects, the other because of inadequate motivation and insight.

Still another supposition is possible,—namely that the only recoveries or rather successful resistances are among the low grade and relatively inert, and among the high grade and competent. It may be that the average soldier falls liable to these war neuroses just as do the low and high grade, but that he succumbs to them on the field of battle or in base hospitals and is listed among the casualties. This, while not very probable, is still a possibility.

However, reports indicate that something like

75 per cent. of the functional cases make fairly rapid recovery in a few weeks and return to duty. Hence it seems quite likely that these are the average men, the low and the high being especially liable to continued suffering.

In 252 cases of psychoneurosis, hysteria, neurasthenia and psychasthenia a classification was made on the basis of incidence. In 170 of these particular cases the condition was judged as having developed "in line of duty." In 82 cases the condition was seen, from the anamnesis, to have existed "prior to enlistment," and hence not to have been due to the stress of military service. Comparison of the mental ages of the two groups shows definite inferiority of the "not in line of duty" cases.

The median mental age of the "line of duty" cases is 12.5 years; that of the "prior to enlistment" group is only 11 years. The average mental ages of the two groups are 12.4 and 11.4 years, and the modal ages are 13 and 9 years, respectively. The "line of duty" cases exceed the median of the other group in 71 per cent. of the instances. The semi-interquartile range of both medians is 2.5 years.

The overlapping of the two groups is considerable, but there is definite indication that on the

whole those individuals developing psychoneuroses in civil life and prior to military service are inferior in mental caliber to those who resist these tendencies until the strain of training, discipline and warfare is upon them.

In 591 cases the soldier recorded his degree of education, by stating the last grade of school or year of high school or college which he had completed. In case more advanced training had been received this was also indicated, as in the case of normal school, business school, medical school, etc. In case the individual had never attended school this fact was indicated, the greater number of these cases being illiterate. In the following table are given the ten main diagnostic groups, the median degree of education attained, the per cent having no education at all, the average mental age of the different diagnostic groups as determined by whatever tests were employed in the group.

There is shown here the same hierarchy of status that was shown by the statement of median mental ages. The mental defectives reach a median education of only the second grade. The hysterics, epileptics and constitutional psychopaths fail to attain, so far as their median is concerned, a grammar school education. In none of

TABLE V

Diagnosis	Median Amount of Education	Per Cent With No Education	Average Mental Age	Number Of Cases
Mental Deficiency..	2nd Grade	39	9.0 Yrs.	41
Hysteria.....	5th "	23	11.9 "	94
Epilepsy.....	6th "	23	12.0 "	174
Const. Psychopathy	7th "	13	12.5 "	39
Psychoneurosis.....	7th "	11	12.6 "	86
Neurasthenia.....	8th "	5	13.0 "	57
Concussion.....	8th "	5	13.0 "	37
Organic Conditions.	8th "	3	14.0 "	34
Cer-Spin. Meningitis	8th "	0	14.6 "	21
Psychasthenia.....	9th "	0	14.9 "	8

the remaining groups does the median education exceed the grammar school except in the case of the psychasthenic group.

The number of those with no education at all shows the same order precisely. About 40 per cent. of the mental defectives have had no schooling; about 25 per cent. of the hysteric and epileptic; about 12 per cent. of the constitutional psychopathic and general psychoneurotic; only 5 per cent. of the cases of concussion and neurasthenia; whereas in organic conditions there are only 3 per cent. and in the two remaining groups none at all with no education.

The average mental ages of these groups show a striking parallel with educational attainments.

The mental defectives have the very low average mental age of nine years. Of the other groups, all except the organic conditions (including meningitis) and the psychasthenic group are below the mental level of the average soldier. The psychasthenic group average about one year superior to the average soldier in mental age.

These results have special interest when compared with similar data relating to actually wounded soldiers. Baldwin shows (Distribution of School Training of Wounded Soldiers, School and Society, X, No. 258, 680) that of 735 soldiers enrolled in the Department of Occupational Therapy in Walter Reed General Hospital only 3.7 per cent. had no schooling. In none of our groups except Organic Conditions (including here Meningitis) is the percentage of unschooled so low as this, the per cent. of the diagnosed group being over 17 per cent. instead. Considering the neurotic group as a whole, a total of 836 cases including those undiagnosed at the time, 26 per cent. recorded no schooling. Baldwin suggests moreover that inasmuch as his cases included only those enrolled in the educational classes of the hospital this selection may have operated to lower the average schooling. Since our own cases represent an unselected sampling of all cases arriv-

ing at the hospital for war neuroses, the evidence of the educational poverty of these cases is indisputable. Baldwin further states that "a subsequent study of 12,000 cases in different hospitals made by the Surgeon General's Office shows that 25 per cent. reached the eighth grade." Only 15 per cent. of the cases here studied reached that point. Among Baldwin's cases twice as many graduated from high school as did in the neurotic group, 8.6 per cent. as compared with 4.4 per cent.

Those to whom these results have already been exhibited or with whom they have been discussed have occasionally remarked that perhaps the inferior showing of these patients in the series of mental measurements was a result of their sickness, rather than a constitutional characteristic. Quite aside from the general considerations indicating that it is constitutional inferiority rather than momentary interference or weakness that is here measured, the records of educational attainment here given show very clearly that the inferiority antedated the present days of illness. It is indeed quite probable that in certain of the less obscure cases of Epilepsy and in all of the cases of Mental Deficiency the constitutional characteristics definitely interfered with schooling. That this should be the case with Neurasthenia,

Concussion, etc., is far from probable. Even in the case of Mental Deficiency and most of the cases of Epilepsy, it was most certainly the constitutional inadequacy rather than the physically incapacitating character of the disorder that underlay the failure in educational achievement.

Although, as suggested in the beginning, data concerning the intellectual status of the psychoneurotic are rare, occasional reports of soldiers with war neuroses are on record which agree in a general way with our own findings, although in no cases yet found are actual data given. Thus Farrar (*Am. Jour. of Insanity,* April, 1917), in discussing the analysis of the population of the Ontario Military Hospital (fifty cases only) remarks: "It may be set down simply as a matter of record that the patients who had suffered from shock symptoms, and of whom records and observation were sufficient for an approximate estimate of personality, exhibited almost without exception, certainly in more than 90 per cent. a constitutional predisposition. Most of them belong to the schizophrenic and defective groups."

MacCurdy, in a general discussion of "War Neuroses" (*Psychiatric Bulletin,* July, 1917), comments on "the striking fact that the vast majority of those suffering from the pure anxiety

states are officers, while the conversion hysterias are almost entirely confined to the privates and non-commissioned officers. The most obvious difference between these two groups of men lies in their intelligence, and here we find an analogy with the experience of civilian practice. The common conversion hysterias are met with in times of peace very largely among the lower and more poorly educated classes, while more intelligent people are apt to be free from them."

Similarly Adrian and Yealland *(Lancet,* London, June 9, 1917) write, "The chief phenomena underlying the hysterical type of mind are weakness of the will and of the intellect, hypersuggestibility and negativism. The majority of the patients are below the average normal intelligence as judged by the Binet-Simon scale, and others who are more highly equipped prove to have an unstable history either personally or in the family."

Burton-Fanning writes particularly concerning the neurasthenic conditions among soldiers *(Lancet,* London, June 16, 1917). He thinks that the prevention of neurasthenia comes within the sphere of education. All classes are affected, but few of his patients, he finds, have had a public school education, and so have not had the bene-

fits of that "atmosphere in which character and manliness are developed side by side with learning, and which seems to prevent neurasthenia." It is clear, from this naïve statement, that Burton-Fanning does not attribute to the neurasthenic the constitutionally inferior intelligence definitely recognized by MacCurdy and by Adrian and Yealland and quantitatively displayed in our own findings. But their educational poverty was apparent to him and is borne out by our own records. Enough is now known about educational poverty to place the blame for it where it most usually belongs, namely, on intellectual incapacity to profit from either the formal or the material features of the schoolroom.

The danger of generalizations based on hasty and impressionistic observations in such a field as this is well illustrated by the report of Salmon ("Care and Treatment of Mental Diseases and War Neuroses in the British Army"). This observer writes: "Mental defectives develop war neuroses, in spite of statements to the contrary, but with striking infrequency. The generally high standards of intelligence among the patients in the 'shell shock' hospitals is noticeable."

CHAPTER VII

SPECIFIC SYMPTOMS AND INTELLIGENCE IN THE PSYCHONEUROTIC

The literature of the war neuroses bears quite consistent testimony to a difference in incidence in the case of the various clinical forms of these disorders. Thus MacCurdy *(Psychiatric Bulletin,* July, 1917) comments on "the striking fact that the vast majority of those suffering from the pure anxiety state are officers, while the conversion hysterias are almost entirely confined to the privates and noncommissioned officers." Curschmann (quoted by Farrar, *Am. Jour. of Insan.,* April, 1917) found that "naïve gross manifestations of hysteria (mutism, violent tremors and tics, contractures, etc.) were extremely rare in officers even following exposure to severe shell and mine explosions. A circular letter of inquiry addressed to a large number of colleagues with extensive practice among officers verified this finding practically without exception, and it was further supported by the experience of numerous colleagues in the field." Farrar writes, further, "English

authorities have made similar observations. Colonel Meyers comments, for example, upon the infrequency of mutism from shell shock among officers, as compared with the men, and reported that he had seen no such case." Rivers (*Mental Hygiene,* October, 1918) writes, "The conclusion is that the private soldier is especially apt to succumb to that form of neurosis which closely resembles the effects produced by hypnotism or other forms of suggestion. The officer, on the other hand, is less prone to this form of neurosis and falls a victim to it only when there is some organic injury which acts as a continuous source of suggestion. On the other hand the officer is especially liable to anxiety neurosis—states of anxiety, the form taken by his nervous disorder."

That such a difference exists in general between the characteristic symptoms developed by officers on the one hand and by the enlisted men on the other seems certain from the consistency of the reports. It is, however, true that practically all forms occur among the enlisted men, and, as our data show, in considerable numbers in each case. Thus, among our 940 diagnosed cases the hysteric form was by far the most frequent, among the functional conditions. In this group there were 177 cases. But there were also 83 cases diagnosed

as neurasthenia, 41 cases of concussion, 11 cases of psychasthenia and 114 cases of psychoneurosis not further specified. And all these cases were enlisted men, since none of the officers reported for psychological examination, nor were they included in the group surveys.

It is obvious then that the occurrence of the one or the other of the various clinical pictures is not determined solely by the military status of the patient. It is not possible, on the basis of our data, to report the occurrence of the hysteric symptoms among officers, but it is sufficiently clear that the neurasthenic and anxiety conditions occur with considerable frequency among the enlisted men. The suggestion at once presents itself that there may be some demonstrable difference between these various groups of enlisted men which will explain the difference in their symptoms. Such a characteristic, if present, may then perhaps be found to explain the difference between enlisted men on the whole and officers as a class. It is entirely possible that military status is only an accidental or perhaps a correlated fact, rather than the original influence.

In 179 of the cases under consideration, the specific symptoms manifested by the patient were recorded. So far as the present study is concerned

these cases are chosen at random. The case cards in the record office were taken in the order in which the patients were admitted to the hospital. From these cards were copied first the general diagnosis, then such specific symptoms as had seemed to the examining psychiatrists sufficiently definite and particular to merit indication. In a few cases, in which no specific symptoms were mentioned on the case card, the clinical histories were consulted and the specific nature of the complaint secured from this source. The clerks engaged in this transcribing knew nothing of the purpose for which the data were to be used, and even if they should have been so informed, they would have had no information concerning the intelligence rating of the individual patients.

After this tabulation had been completed, the individuals were classified under three headings, according to the nature of their specific complaints. In Class I were placed all cases in which the specific symptom was definitely *physical* in character, representing a bodily disability of an objective sort, which would be clearly observable by an onlooker and which would manifestly interfere with the patient's activity and work. In this class came such complaints as fits, tremor, stuttering, seizures, dizziness, tics, paralyses, contrac-

tures, sensory disturbances, anæsthesias, blindness, deafness, aphonia, weakness, enuresis, cardiac trouble, hemiplegia, convulsions. In Class III were placed those individuals whose specific complaints were definitely of a *psychic* or subjective character, not externally obvious to the observer. In this class came such complaints as fears, worries, anxieties, obsessions, sexual ruminations, psychasthenia, hypochondria, bad dreams, nightmares, phobias, emotional disturbance, excitement, amnesias, aboulias, depressions. In Class II, an intermediate class, were placed individuals of two sorts. Cases showing specific symptoms both of Class I and of Class III were placed in Class II, as uncertain cases. Thus an individual with a functional paralysis, accompanied by anxiety states and fears, would belong in Class II, as a "composite" case. Further, in this class were placed individuals manifesting an array of complaints which to the writer were apparently "transition" symptoms—that is symptoms neither clearly physical and objective nor clearly psychic or subjective. Thus "headache" may be considered on the one hand as a definite somatic disturbance of the objective sort, in so far as it may clearly incapacitate the patient and be fairly obvious to the observer in its consequences. On

the other hand it is by no means as objective or somatic as is a paralysis, a contracture or a convulsion. Hence it is placed also in the intermediate class as a transition or doubtful criterion. In Class II, thus, were placed cases complaining of headache, pains, insomnia, somnambulisms, queer feelings, chills, restlessness, fatigue, fainting spells marked simply by loss of consciousness with no convulsions, doubtful cases, and cases clearly combining the symptoms of Classes I and III.

The psychological examination records were then consulted, and the intelligence rating of each individual recorded. The reason why there were no more than 179 in the total group was because this study was undertaken before all case records were available. But this again represents in no sense a selection of cases since examinations were given immediately on arrival at the hospital, especially when large groups were received. Members of small groups were often not examined.

The intelligence ratings of these three groups, in terms of median mental age as based either on the Group Survey tests or on individual examination or in some cases on both methods, are distributed as follows:

TABLE VI

FREQUENCIES

Mental Age	Class I Objective or Physical		Class II Doubtful or Transitional		Class III Subjective or Mental	
	Cases	Per cent	Cases	Per cent	Cases	Per cent
Failure	4	4.4	2	3.3	1	3.6
5– 6....	5	5.5	1	1.6	0	0
6– 7....	5	5.5	1	1.6	0	0
7– 8....	8	9.0	5	8.2	0	0
8– 9....	4	4.4	2	3.3	0	0
9–10....	7	7.8	8	13.0	2	7.1
10–11....	13	14.5	6	9.8	0	0
11–12....	13	14.5	6	9.8	6	21.5
12–13....	12	13.3	9	17.7	3	10.7
13–14....	5	5.5	4	6.5	2	7.1
14–15....	6	6.7	2	3.3	3	10.7
15–16....	6	6.7	6	9.8	6	21.5
16–17....	0	0	3	4.9	3	10.7
17–18....	2	2.2	5	8.2	2	7.1
18–.....	0	0	1	1.6	0	0
Cases...	90		61		28	Total Cases 179

Or grouped by two-year intervals so as to equalize irregularities, the distribution is as shown in Table VII.

The median mental ages of the three Classes are shown in Table VIII. The Average Deviation in each case has been calculated without including the 4 cases in Class I, the 2 in Class II and

TABLE VII

FREQUENCIES

	Class I Objective or Physical		Class II Doubtful Transitional		Class III Subjective Mental	
	Cases	Per cent	Cases	Per cent	Cases	Per cent
Below 6.	9	9.9	3	4.9	1	3.6
6– 8....	13	14.5	6	9.8	0	0
8–10....	11	12.2	10	16.3	2	7.1
10–12....	26	29.0	12	19.6	6	21.5
12–14....	17	18.8	13	24.2	5	17.8
14–16....	12	13.4	8	13.1	9	32.2
16–18....	2	2.2	8	13.1	5	17.8
Over 18..	0	0	1	1.6	0	0
Median..	10.9		12.0		14.5	
M. V....	2.1		2.6		2.0	
Cases....	86		59		27	

the 1 in Class III that were unable to do the group tests, were not individually tested, and hence are included in the Tables as simply "Failure."

Although there is considerable overlapping of the three groups, the Class I and Class III cases are quite distinct from each other, differing from each other by 3.6 years of mental age. Only 15 per cent. of Class I reach or exceed the median of Class III, while only 10 per cent. of Class III

TABLE VIII

Class	Median Mental Age	Average Deviation	No. of Cases Used
I	10.9	2.1	86
II	12.0	2.6	59
III	14.5	2.0	27

fall as low as the median of Class I. Class II is seen to be actually an intermediate or transition group in intellectual capacity, as well as in character of symptoms. The Mode for Class I is at 11 years; that for Class II at 13 years, that for Class III at 15 years. There is thus a difference of two years in mental age between adjacent groups.

It is clear that the difference in specific symptoms is correlated with a difference in mental level. The individuals with overt, objective, somatic, and postural symptoms are four years inferior in intelligence rating to those individuals whose symptoms are psychic, subjective or autonomic. Those individuals manifesting a combination of both types or showing the uncertain types of symptoms constitute mentally also an intermediate group. It is also to be noted that, of those

individuals in Class III whose mental rating was available, only two fall below 11.5 years of mental age, these two lying between 9 and 10. That is to say, with two exceptions out of a total of 27 determined cases, all of Class III are above the median age of Class I.

Rivers, in a recent discussion of "War Neuroses and Military Training," has commented on the tendency of certain types of psychoneurotic symptoms which occur more frequently among enlisted men than among officers. He classifies the specific symptoms of the psychoneuroses into three main groups, closely corresponding to the three groups distinguished in the present report. As the following quotation will indicate, Rivers stresses mainly the type of training and the nature of military duties as the factors which determine the specific type of symptom presented.

> Excluding from the category of neurosis cases of simple exhaustion or concussion and disorders of circulation or digestion due to infection, and excluding also definite psychoses, cases of war-neurosis fall into three main groups, though intermediate and mixed examples are of frequent occurrence.
>
> The first group comprises cases in which the disorder finds expression in some definite physical form, such as paralysis, mutism, contracture, blindness, deafness or other anæsthesia, or in some form of convulsive seiz-

ure. . . . I shall be content to speak of this group as hysteria. . . .

The second group consists of cases in which the disorder shows itself especially in lack of physical and mental energy, in disorders of sleep and of the circulatory, digestive and urogenital systems. On the mental side there is usually depression, restlessness, irritability, and enfeeblement of memory, and on the physical side tremors, tics, or disorders of speech. This group is usually known as neurasthenia . . . but . . . I shall . . . speak of it by the term, anxiety neurosis.

The third group, with which I shall have little to do in this report, is characterized by the definitely psychical form of its manifestations. This group comprises a number of different varieties. In some cases the most obvious symptom is mental instability and restlessness with alternations of depression and excitement or exaltation, similar to those of manic-depressive insanity. In other cases there are morbid impulses of various kinds, including those towards suicide or homicide. In others the chief symptoms are obsessions or phobias, while others suffer from hallucinations or delusions.

There is no evidence that the psychoneuroses of the third group are especially liable to affect either officers or men, but the other two groups show a remarkable difference in this respect. . . . The group which I have provisionally labeled hysteria is especially apt to affect the private soldier. The second group, neurasthenia, (or anxiety neurosis) is not similarly limited to officers, but affects them more frequently, and usually more profoundly, than the private soldier. . . . I hope to show that this difference can be largely explained by differences in the character and effects of military training

and military duties. . . . The conclusion is that the private soldier is especially apt to succumb to that form of neurosis which closely resembles the effects produced by hypnotism or other forms of suggestion because his military training has been of a kind to enhance his suggestibility. The officer, on the other hand, is less prone to this form of neurosis and falls a victim to it only when there is some organic injury which acts as a continuous source of suggestion. On the other hand the officer is especially liable to anxiety neurosis (neurasthenia) because the nature of his duties especially puts him into positions of responsibility which produce or accentuate mental conflicts set up by repression, thus producing states of anxiety, the form taken by his nervous disorder.[1]

MacCurdy *(Psychiatric Bulletin,* July, 1917), having pointed out the tendency on the part of officers to show the "pure anxiety state" as contrasted with the privates and noncommissioned officers who more commonly suffer from "the conversion hysterias," recognizes that "the most obvious difference between these two groups of men lies in their intelligence," and that this fact has much to do with the determination of the clinical picture.

. . . The modern educated man knows enough of neurology to realize, even if it be in a vague way, that

[1] "War Neurosis and Military Training," W. H. R. Rivers, *Mental Hygiene,* October, 1918.

paralysis comes from injury to a nerve or the central nervous system at some distance from the site of the paralysis. The intelligent layman, for example, knows that if he breaks his wrist, the forearm and hand are apt to be painful and consequently there may be some weakness in the forearm and hand, but he does not expect that all the muscles involved in wrist movements will be paralyzed. He would expect this to occur more probably after a paralytic stroke, injury to the spinal cord or an accident to a nerve in the upper arm. The ignorant dispensary or hospital patient, on the other hand, has a definite association in his mind between local symptoms and local functions and he has little if any conception of nervous control from a distance. An example of this failure to localize function correctly is the popular use of the term "a strong wrist" when a strong forearm is really meant.

MacCurdy points out further, however, that "the difference between officers and men does not begin and end with intelligence and education. That one is a leader and another a follower is equally the result of a difference in ideals and emotional attitude." He then discusses the difference in duties, responsibilities and necessary ideals of officers and men, concluding that "the officer must be endowed with higher ideals than the private soldier. It is to this more than to any other factor that we may ascribe the differ-

ence between their clinical histories, when war neuroses develop."

He then elaborates a conception of the "transformation of wishes into symptoms." The private simply develops a "conversion symptom" and "the determination of the particular symptom can usually be traced to some previous illness, when the function in question was organically disturbed." In the case of the officer, however, "When fatigue and the horrors of war grow upon him, he does not let his fancy play with any failure to meet his full responsibilities but looks forward rather to making the supreme sacrifice, namely, that of dying for his country." This "wish for death" is conceived as being converted into an "anxiety symptom," commonly taking the form of nightmares which "do not seem to develop until the wish for death has appeared. It is possible, therefore, that the unconscious mind seizes on that in the environment which is most likely to occasion death and makes the patient dream of this danger. The "wish-fulfillment" therefore, in the dream of being shelled or bayoneted may be ascribed to the wish for death which may previously have been rather diffuse and now becomes specifically allied with one particular form of mortal danger." The only explana-

tion suggested for the presence of anxiety in these dreams is that "emotional reactions in dreams seem to represent the natural reactions of the individual, as an individual, rather than of the socialized being who is burdened with a feeling of moral responsibility"; although it is also suggested, by way of additional explanation that "any man is often most fearful of that which he unconsciously most desires."

It is clear from the results presented in the present report that, however important the enhanced suggestibility of the enlisted man and the duties of the officer may be in determining the type of symptom they are most likely to present, these are by no means the only factors, perhaps, indeed, not even the most potent factors.

We have shown that the lower in intelligence the individual soldier, the more liable he is to display somatic and postural symptoms of the definitely "conversion" type of hysteria. Ascending the scale of intelligence these physical symptoms tend to fall away and in their place is substituted the more strictly neurasthenic and still higher up the more exclusively mental or psychasthenic symptoms. So distinct is this advance along the intelligence scale that a difference of 4 years of mental age exists between the average of the ex-

treme classifications. When it is borne in mind that the general level of intelligence is low in these cases, and that this four years difference is on a background of less than 12 years of mental age, the difference cannot fail to appear significant.

It need scarcely be pointed out that officers represent a group distinctly superior in intelligence to the highest group represented in this report. If the general principle suggested here is valid we should certainly expect highly intelligent officers to show still fewer "conversion" symptoms and more and more to incline toward the psychasthenic picture. Officers, from the very beginning, and quite irrespective of their training and duties, would be expected to manifest psychasthenic rather than hysteric or neurasthenic reactions.

It is indeed entirely possible that the correlation between anxiety neurosis and responsibility on the one hand and between somatic disorders and enhanced suggestibility on the other hand, is only the superficial statement of a single fact—the dependence of the clinical picture on the intelligence level of the individual. The very factor that predisposes the private soldier toward hysteric symptoms is also the factor that orig-

inally determined his military status and his failure to receive a commission. Officers are commissioned because of just that degree of intelligence which predisposes them toward the anxiety picture.

CHAPTER VIII

THE ROLE OF MOTIVATION IN THE PSYCHONEUROSES

The fact that motivation plays an important rôle in the development and determination of psychoneurotic symptoms has of course long been recognized. It was at one time common to accuse the psychoneurotic of deliberate and malicious malingering or simulation, so closely related did the symptoms seem to be to the general situation of the individual's life and duties. But experience soon showed that a more complex mechanism than overt pretense lay at the bottom of these conditions. In the concept, developed with particular pains by Janet, of the reliving of an emotional crisis as descriptive of many of the hysteric attacks and symptoms, the rôle of motivation is also recognized, but in a much more general manner—the symptoms on this basis represent the expression of a revived affective or volitional experience, and are not to be understood without relating them to the original stress.

In more recent attempts to understand the symptoms of the psychoneurotic the supposed im-

portance of motivation has been carried to a degree of elaboration that to many seems fantastic in the extreme. On this basis each symptom is conceived as in one or another way the disguised realization or conversion of a definite wish or trend of the individual. The origin of the symptom is to be found in the complications of the patient's emotional and instinctive adjustments to the constraining influences of counter trends, or of social pressure, taboo, conscience, and other censorial forces. The use of the term "libido" in connection with these theories gives particular stress to the element of motivation, as contrasted with the intellectual, cognitive, developmental or the general neurological factors.

The present data make it possible in an interesting way to exhibit objectively and quantitatively the influence of motivation on the development of and recovery from the ordinary clinical complaints, and reveal important differences between the various diagnostic groups in the degree of this influence. In the Group Survey there was included a Personal Data record, which we prefer to designate as the Psychoneurotic Inventory. This Inventory was prepared by Prof. Woodworth, and has been described in Franz's

Handbook for Mental Examination. It was just being put into general use in the preliminary examination of recruits in the various camps when the armistice came. It consists of a series of 116 questions, each inquiring into the presence of some more or less common clinical complaint encountered in dealing with the neurotic. Each question is followed by YES-NO, and the patient responds by underlining the answer (either YES or NO) which applies in his case. The original purpose of the blank was not so much to afford information concerning the particular symptoms manifested but rather to afford an indication of the number of such complaints reported by him. The individual reporting more than the usual number of such complaints would presumably be a suspicious case, who should merit further and detailed psychiatric examination. In the present instance, however, the interest will lie not only in these numerical scores of individuals but also in certain other ways of considering the material.

For convenience of reference the whole blank is reproduced, the questions being numbered to facilitate cross reference in connection with the tables of results.

1. Do you usually feel well and strong? YES NO
2. Do you usually sleep well? YES NO
3. Are you often frightened in the middle of the night? YES NO
4. Are you troubled with dreams about your work? YES NO
5. Do you have nightmare? YES NO
6. Do you have too many sexual dreams? YES NO
7. Do you ever walk in your sleep? YES NO
8. Do you have the sensation of falling when going to sleep? YES NO
9. Does your heart ever thump in your ears so that you cannot sleep? YES NO
10. Do ideas run through your head so that you cannot sleep? YES NO
11. Do you feel well rested in the morning? YES NO
12. Do your eyes often pain you? YES NO
13. Do things ever seem to swim or get misty before your eyes? YES NO
14. Do you often have the feeling of suffocating? YES NO
15. Do you have continual itchings in the face? YES NO
16. Are you bothered much by blushing? YES NO
17. Are you bothered by fluttering of the heart? YES NO
18. Do you feel tired most of the time? YES NO
19. Have you ever had fits of dizziness? YES NO
20. Do you have queer, unpleasant feelings in any part of the body? YES NO
21. Do you ever feel an awful pressure in or about the head? YES NO

22. Do you often have bad pains in any part of the body? YES NO
Where .....
23. Do you have a great many bad headaches? YES NO
24. Is your head apt to ache on one side? YES NO
25. Have you *ever* fainted away? YES NO
26. Have you *often* fainted away? YES NO
27. Have you ever been blind, half-blind, deaf or dumb for a time? YES NO
28. Have you ever had an arm or leg paralyzed? YES NO
29. Have you ever lost your memory for a time? YES NO
30. Did you have a happy childhood? YES NO
31. Were you happy when 14 to 18 years old? YES NO
32. Were you considered a bad boy? YES NO
33. As a child did you like to play alone better than to play with other children? YES NO
34. Did the other children let you play with them? YES NO
35. Were you shy with other boys? YES NO
36. Did you ever run away from home? YES NO
37. Did you ever have a strong desire to run away from home? YES NO
38. Has your family always treated you right? YES NO
39. Did the teachers in school generally treat you right? YES NO
40. Have your employers generally treated you right? YES NO

41. Do you know of anybody who is trying to do you harm? YES NO
42. Do people find fault with you more than you deserve? YES NO
43. Do you make friends easily? YES NO
44. Did you ever make love to a girl? YES NO
45. Do you get used to new places quickly? YES NO
46. Do you find your way about easily? YES NO
47. Does liquor make you quarrelsome? YES NO
48. Do you think drinking has hurt you? YES NO
49. Do you think tobacco has hurt you? YES NO
50. Do you think you have hurt yourself by going too much with women? YES NO
51. Have you hurt yourself by masturbation (self-abuse)? YES NO
52. Did you ever think you had lost your manhood? YES NO
53. Have you ever had any great mental shock? YES NO
54. Have you ever seen a vision? YES NO
55. Did you ever have the habit of taking any form of "dope"? YES NO
56. Do you have trouble in walking in the dark? YES NO
57. Have you ever felt as if some one was hynotizing you and making you act against your will? YES NO
58. Are you ever bothered by the feeling that people are reading your thoughts? YES NO
59. Do you ever have a queer feeling as if you were not your old self? YES NO

60. Are you ever bothered by a feeling that things are not real? YES NO
61. Are you troubled with the idea that people are watching you on the street? YES NO
62. Are you troubled with the fear of being crushed in a crowd? YES NO
63. Does it make you uneasy to cross a bridge over a river? YES NO
64. Does it make you uneasy to go into a tunnel or subway? YES NO
65. Does it make you uneasy to have to cross a wide street or open square? YES NO
66. Does it make you uneasy to sit in a small room with the door shut? YES NO
67. Do you usually know just what you want to do next? YES NO
68. Do you worry too much about little things? YES NO
69. Do you think you worry too much when you have an unfinished job on your hands? YES NO
70. Do you think you have too much trouble in making up your mind? YES NO
71. Can you do good work while people are looking on? YES NO
72. Do you get rattled easily? YES NO
73. Can you sit still without fidgeting? YES NO
74. Does your mind wander badly so that you lose track of what you are doing? YES NO
75. Does some particular useless thought

keep coming into your mind to bother you? YES NO

76. Can you do the little chores of the day without worrying over them? YES NO

77. Do you feel you must do a thing over several times before you can drop it? YES NO

78. Are you afraid of responsibility? YES NO

79. Do you feel like jumping off when you are on a high place? YES NO

80. At night are you troubled with the idea that somebody is following you? YES NO

81. Do you find it difficult to pass urine in the presence of others? YES NO

82. Do you have a great fear of fire? YES NO

83. Do you ever feel a strong desire to go and set fire to something? YES NO

84. Do you ever feel a strong desire to steal things? YES NO

85. Did you ever have the habit of biting your finger nails? YES NO

86. Did you ever have the habit of stuttering? YES NO

87. Did you ever have the habit of twitching your face, neck or shoulders? YES NO

88. Did you ever have the habit of wetting the bed? YES NO

89. Are you troubled with shyness? YES NO

90. Have you a good appetite? YES NO

91. Is it easy to make you laugh? YES NO

92. Is it easy to get you angry? YES NO

93. Is it easy to get you cross or grouchy? YES NO

94. Do you get tired of people quickly? YES NO

95. Do you get tired of amusements quickly? YES NO
96. Do you get tired of work quickly? YES NO
97. Do your interests change frequently? YES NO
98. Do your feelings keep changing from happy to sad and from sad to happy without any reason? YES NO
99. Do you feel sad or low-spirited most of the time? YES NO
100. Did you ever have a strong desire to commit suicide? YES NO
101. Did you ever have heart disease? YES NO
102. Did you ever have St. Vitus's dance? YES NO
103. Did you ever have convulsions? YES NO
104. Did you ever have anemia badly? YES NO
105. Did you ever have dyspepsia? YES NO
106. Did you ever have asthma or hay fever? YES NO
107. Did you ever have a nervous breakdown? YES NO
108. Have you ever been afraid of going insane? YES NO
109. Have any of your family been insane, epileptic, or feeble-minded? YES NO
110. Has any of your family commited suicide? YES NO
111. Has any of your family had a drug habit? YES NO
112. Has any of your family been a drunkard? YES NO
113. Can you stand pain quietly? YES NO
114. Can you stand the sight of blood? YES NO

115. Can you stand disgusting smells? YES NO
116. Do you like out-door life? YES NO

REMARKS

Write here anything you would like to say on any of the questions.

It was fortunate that the use of this blank with all incoming patients was begun relatively early so that by the time of the announcement of the armistice six of the diagnostic groups were represented in the returns by a total of 95 cases. After the armistice the method was continued, and by the time the writer's work was interrupted by discharge from the service 179 cases subsequent to the armistice had provided such records in these six diagnostic groups. In addition to these 274 records, there were numerous others secured. But many of these were undiagnosed at the time the work was interrupted, and many of them belonged in diagnostic groups which independently afforded too few cases for such comparisons as are here to be made.

With such material at hand it is possible to consider each of the clinical complaints as reported both before and after the announcement of the armistice. This affords opportunity to secure

definite measures of the influence of motivation on the report of symptoms. It is well understood, of course, that up to the date of the armistice the general motivation of these cases in the main was characterized by the desire to remain in the hospital, or at least to appear so incapacitated that return to service would be improbable. This was apparent in conversation with the patients, and it was a form of motivation which although not always explicitly formulated or articulated was relatively near the surface and easily inferred from the conduct and character of the patient. After the signing of the armistice, however, this motivation markedly changed. Restoration of functional capacity was no longer inevitably connected with return to active service on the part of the large majority. On the other hand definite promises were frequently made that recovery would mean discharge and return to civil life. Whereas before the armistice the motivation had been, consciously or implicitly, toward prolonged invalidism, after the armistice the motivation was generally directed toward recovery, except in the relatively few cases complicated by interest in compensation. The effect of this change in motivation on the state of mind and health of the patients with functional neuroses has often been remarked,

but usually the evidence has been only impressionistic, anecdotal, not easily verifiable and certainly not susceptible of quantitative statement. The data here afforded show in unmistakable terms the precise nature and the degree of prevalence of this effect of change in motivation.

Thus Question 1 "Do you usually feel well and strong?" would reveal positive symptom if reported "No." Before the armistice such positive symptom (failure to feel well and strong) was reported by 82 per cent. of the hysterics, 70 per cent. of psychoneurotics, 91 per cent. of neurasthenics, 86 per cent. of constitutional psychopaths, 44 per cent. of concussions, and 34 per cent. of the epileptics. After the armistice positive symptoms were reported by only 14 per cent., 7 per cent., 16 per cent., 33 per cent., 15 per cent. and 10 per cent. of these diagnoses, respectively. Taking the groups together 68 per cent. reported positive symptoms before the armistice but only 16 per cent. after the armistice. These were of course not identical individuals. The "before" group comprised men who had arrived at the hospital before the armistice, the "after" group were the later arrivals. The striking difference between positive symptoms reported by over two-thirds before and by less than one-sixth after the armistice

suggests at once the importance of that event in determining or modifying the clinical complaint of the individual patient.

In order to facilitate comparison of the various types of complaint as thus modified, and also in order to compare the various clinical conditions in a quantitive fashion, certain arrangements of the data have been made. In the first place a table was prepared giving for each question the number of positive symptoms reported by each diagnostic group, both before and after the armistice. The figure given was the per cent. of the actual number, in order that comparison might be made in spite of the varying numbers of cases in the different diagnoses. The first figure gave the per cent. of positive symptoms (whether reported by Yes or by No) before the armistice and the second figure gave the number after. At the head of each column, under the diagnostic caption, the number of cases, of which the numbers in the table were the percentages, were given in each case. From this complete table were derived the shortened tabulations herein given.

A large number of the questions revealed negative answers (lack of significant symptoms) in most of the diagnoses. Obviously when no one reports the symptom before the armistice, the ef-

fect of this event in improving conditions is not to be measured by this question, since no decrease is possible. Similarly, when but 6 per cent. or 7 per cent. of the group before the armistice report a symptom there is but little opportunity for the armistice to show its influence. Hence in the following tables all questions have been neglected in which positive symptoms were not reported, before the armistice, by at least 25 per cent. of most of the six diagnostic groups.

Using this criterion of selection, 47 of the questions are reported significantly by most of the diagnostic groups. Using these 47 questions only, the derived tables have been prepared. In the first place it is to be observed that the questions differ in character in certain definite ways. Thus "Have you ever seen a vision?" is purely a question of historic fact, in no way bearing on the present condition of the patient; similarly with "Were any of your family insane?" etc. On the other hand such a question as "Do you have continual itchings in the face?" or "Do you have the sensation of falling when going to sleep?" or "Do you feel tired most of the time?" bears directly on the present condition and state of health. Between these two extremes there are certain other questions that are less definite in their reference.

TABLE IX

PERCENTAGES OF POSITIVE SYMPTOMS BEFORE AND AFTER THE ARMISTICE IN CASE OF QUESTIONS BEARING DIRECTLY ON THE PRESENT CONDITION OF THE PATIENTS, ONLY THOSE QUESTIONS BEING CONSIDERED IN WHICH THE NUMBER OF SIGNIFICANT REPLIES BEFORE THE ARMISTICE IS 25 PER CENT OR MORE IN MOST OF THE DIAGNOSTIC GROUPS.

Ques.	Hysteria 11–44	Psycho-neurosis 20–34	Neuras-thenia 11–29	Const. State 7–12	Con-cussion 14–19	Epilepsy 32–41	Or-ganic	Ment. Defic.
1	82–14	70–07	91–16	86–33	44–15	34–10		
2	55–10	50–04	82–33	30–17	58–15	38–15		
3	27–11	40–03	63–11	14–08	42–15	22–13		
4	27–09	20–03	45–11	28–08	21–05	19–13		
8	54–11	35–09	54–18	28–17	35–05	28–15		
10	45–16	35–15	54–39	28–42	50–15	37–13		
11	55–19	80–07	73–46	58–25	44–25	56–84		
17	27–16	55–12	72–31	28–25	35–30	41–15		
18	45–20	40–06	63–31	56–17	42–25	44–20		
20	81–34	60–06	81–46	70–50	42–15	59–25		
23	72–16	45–03	81–70	28–25	63–15	56–32		
24	54–16	45–00	54–24	28–17	70–20	34–28		
59	27–16	45–09	54–35	28–08	42–15	28–17		
67	28–21	40–07	28–19	44–00	23–15	34–12		
68	45–11	40–15	45–24	56–42	21–15	22–10		
70	36–09	30–03	63–21	28–00	14–10	05–08		
72	36–18	50–21	63–77	42–42	50–20	31–30		
73	55–10	40–13	64–30	44–08	58–15	35–17		
74	27–06	45–03	36–18	14–00	28–10	25–13		
75	27–11	30–06	27–21	42–17	28–05	28–05		
76	37–12	20–04	37–16	30–08	16–00	16–01		
77	27–02	05–06	36–49	28–08	14–10	15–08		
92	63–27	40–18	36–28	14–42	42–20	56–25		

Thus "Have your employers generally treated you right?" might be taken as including all employers, both past and present, or it might refer rather to present employers and their general attitude. Similarly "Does your heart ever thump in your ears so that you cannot sleep?" refers, be-

TABLE X]

DATA BEARING ON PURELY HISTORICAL MATTERS OF FACT, QUESTIONS SIGNIFICANTLY ANSWERED BY 25 PER CENT OR MORE IN MOST OF THE DIAGNOSES.

Ques.	Hysteria 11–44	Psycho-neurosis 20–34	Neuras-thenia 11–29	Const. State 7–12	Con-cussion 14–19	Epilepsy 32–41	Or-ganic	Ment. Defic.
19	45–23	50–33	45–28	28–50	35–25	87–58		
25	36–38	35–39	45–28	14–58	42–55	78–63		
27	63–20	30–15	36–25	00–08	21–30	37–15		
29	63–20	40–24	27–25	14–17	28–30	46–20		
30	37–14	25–05	37–09	02–17	16–00	16–10		
31	55–05	70–15	37–02	16–17	09–00	22–03		
53	27–09	35–18	36–25	42–25	50–25	12–15		
85	36–20	40–21	27–18	00–25	42–15	44–27		
87	36–21	40–06	45–18	00–17	21–05	19–10		
107	72–41	60–72	63–39	56–83	63–35	41–38		

TABLE XI

DATA ON INDEFINITE QUESTIONS, REPLIED TO SIGNIFICANTLY BY 25 PER CENT OR MORE IN MOST OF THE DIAGNOSES, BEFORE ARMISTICE.

Ques.	Hysteria 11–44	Psycho-neurosis 20–34	Neuras-thenia 11–29	Const. State 7–12	Con-cussion 14–19	Epilepsy 32–41	Or-ganic	Ment. Defic.
9	18–11	25–12	81–18	14–42	28–20	34–17		
12	36–23	65–12	54–25	28–33	35–10	50–35		
13	54–32	65–15	18–42	42–42	56–15	72–45		
14	36–06	15–09	27–18	28–08	07–20	28–13		
21	72–18	45–00	27–35	42–17	63–10	47–28		
22	63–25	75–27	90–56	70–33	63–25	31–35		
45	37–12	30–07	10–12	30–17	16–00	19–13		
49	27–18	25–21	09–11	28–17	00–20	22–18		
64	36–11	35–03	27–07	14–08	21–10	25–10		
69	36–16	25–24	36–46	42–33	42–25	31–17		
71	19–30	50–13	55–12	58–25	37–15	44–30		
113	19–26	30–28	55–12	44–17	23–35	34–15		
114	19–21	40–13	46–09	30–17	30–15	34–12		
115	55–37	60–37	64–44	58–33	37–35	60–57		

cause of the "ever," not only to present condition but also to past experience.

The questions have consequently been classified into three sub-groups. In Group A are put all questions bearing unmistakably on present condition of health. In Group C are put all questions relating definitely to matters of historic fact. In Group B are placed the intermediate or indefinite questions referring to either the present or the past or to both. In Tables IX, X, XI the results for these three Groups of questions are given, each question being separately reported. Tables XII and XIII bring together the results in summary form.

TABLE XII

QUESTIONS A refer to Present Condition of Patient.
B refer to Indefinite Present or Historical.
C refer to Definite Historical Facts.

Percentages showing positive symptoms before and after armistice

	Psycho-neurosis	Hys-teria	Con-cussion	Neuras-thenia	Const. Psychop-athy	Epil-epsy
A	42–08	45–14	38–15	57–31	37–20	33–19
B	42–16	38–20	33–18	43–25	38–24	38–25
C	43–25	47–21	33–22	40–22	17–31	40–26
Cases	20–34	11–44	14–19	11–29	7–12	32–41

TABLE XIII

FACTS OF ABOVE TABLE STATED BY CONSIDERING THE CONDITION BEFORE THE ARMISTICE AS 100%, IN ALL CASES, AND STATING THE CONDITIONS AFTER THE ARMISTICE IN TERMS OF THIS BASE. WHEN THE SECOND FIGURE IS LOWER THAN 100% IT THUS DENOTES IMPROVEMENT, THAT IS, REPORT OF POSITIVE SYMPTOMS BY FEWER PATIENTS. SECOND FIGURE GIVES THIS RESULT IN THE TABLE.

Influence of the armistice. Ratio after to before.

	Psycho-neurosis	Hys-teria	Concus-sion	Neuras-thenia	Const. Psychop-athy	Epil-epsy
A	100 19	100 31	100 40	100 54	100 54	100 58
B	100 38	100 53	100 55	100 58	100 63	100 66
C	100 58	100 45	100 66	100 55	100 182	100 65
Cases	20 34	11 44	14 19	11 29	7 12	32 41

The general nature of the results is best to be seen from the summary tables. Thus in Table XII the numbers (per cent.) giving positive symptoms for the different questions have been averaged for each of the three groups of questions and for each of the diagnostic groups. In Table XIII the average number of positive reports before the armistice is taken as 100 per cent. and the

number reporting these significant symptoms after the armistice is stated in terms of this as a basis. The first number (before the armistice) is then always 100 per cent. The second number gives the results after the armistice. If this is also 100 per cent. it will mean that no change in frequency of the symptoms took place. If the second number falls below 100 per cent. it will mean a lesser frequency of report than before the armistice, and hence an improvement in condition.

The results are very striking. Considering the A questions, bearing directly on present condition, each diagnostic group shows distinct improvement, or better health. But the change is by no means equal with all the diagnoses. In Psychoneurosis and Hysteria the symptoms fall from 100 per cent. to 19 per cent. and 31 per cent., a most notable therapeutic accomplishment. In Concussion, Neurasthenia, Constitutional Psychopathy and Epilepsy the improvement is less striking, being most in Concussion and least in Epilepsy. Considering the B questions, with their more indefinite reference, the influence is seen to be less striking than in the case of the questions bearing directly on present condition. In general the order of susceptibility to the effect is similar to that in the case of the A questions—the Hysteric

and Psychoneurotic are most sensitive, and the Epileptic least. In the case of the C questions, relating to matters of plain historic fact, the effect is still less noticeable, and the order of sensitivity to the armistice influence is the same as before. (Probably because of the small number of cases in that group, the Constitutional Psychopath group gives a value in excess of 100 per cent. in the case of the C questions. This is the only decidedly irregular result in the Table.)

The most general results are then two in number. First, as compared with the frequency of positive symptoms before the armistice considering all the diagnostic groups, the frequency falls after the armistice to about 40 per cent., 55 per cent., and 65 per cent. in the case of the A, B and C questions respectively. The present condition of patients becomes enormously improved. Not only is this true, but even the facts of their history are more optimistically reported, and intermediate facts are intermediately colored.

In the second place the various diagnostic groups are far from being equally susceptible to this influence. The Epileptics, as a matter of fact, show practically no difference in the reports of their A, B and C questions, the drop being in all three cases about 65 per cent. But it will be ob-

served that a drop to 65 per cent. is just equivalent to that shown in general by all the diagnoses, when reporting on matters of plain historic fact. Apparently, then, all that happens to the Epileptic is the general elation of spirits and buoyancy of attitude and evaluation of fact that leads to the apparent improvement of the facts of antecedent history in all of the diagnoses. There is here no essentially clinical effect, but only an effect of general attitude and optimism. If now the Neurasthenic and Constitutional Psychopathic groups be considered, it is seen that here too the effect produced is only that of the general buoyancy disclosed in all the diagnoses in the case of the C questions.

In Psychoneurosis, on the other hand, the facts are very different. The usual buoyant effect is shown in the C questions, bearing on matters of historic fact. But in the case of the questions relating specifically to present symptoms the improvement is about twice as great as this, and in the case of the B questions the effect is about half again as great. In the simple Hysteria group much the same effect is found, the drop in the case of the A questions being especially marked. To a somewhat lesser degree, but sufficiently to show their resemblance to Hysteria and Psychoneurosis

rather than to the remaining diagnoses in this respect, are the cases of Concussion.

With respect to general susceptibility to the effects of changed motivation Hysteria and Psychoneurosis are clearly the most sensitive, and are about equal in this respect,—the former ranks second in the A and B questions and first in the C; the latter ranks first in the A and B questions and third in the C. Concussion and Neurasthenia occupy middle ground, with practically equal sensitivity, while Constitutional Psychopathy and Epilepsy reveal only the general elation found even in the case of pure matters of historic fact.

The nature of the effect here shown is no doubt far from simple. If we take, for example, the purely historic facts, and their report, it is far from clear that the conditions reported before the armistice represent the truth, only the reports after the armistice being influenced by falsification. Nor can it be assumed that the facts reported after the armistice represent the truth, which was perverted in the earlier reports. And yet there is no reason whatever to believe that these simple matters of heredity and the facts of experience and original constitution were only accidently so consistently more favorable in the case of the patients arriving after the armistice. No doubt an

effect of double distortion of fact is present. Before the armistice the general disposition toward invalidism inclined the reports toward unfavorable perversion and pessimistic interpretation. After the armistice the general urge toward release from military service led in much the same way, and probably to much the same degree, toward a favorable distortion of biography, heredity and experience, and a more optimistic interpretation than the actual facts would warrant in a report not definitely biased by motivation. The true state of the facts would on this assumption be represented best by an average of the two percentages of positive symptoms, rather than by either or both. It is interesting that, although both tendencies are "functional," only the tendency to "simulation" is commonly recognized as a "disease."

In the case of the A questions, bearing directly on the present condition of the patient, it is clear that at least in Hysteria, Psychoneurosis and Concussion there is in addition to this duplex effect of distortion a definite clinical effect of the motivation, or else that the duplex effect of distortion is (here only) considerably greater in the case of the clinical facts than in the case of the facts of history. Our general knowledge of these conditions

and of the mechanism of their development and therapy makes it entirely likely that the former is the case, and that in these conditions the clinical symptoms manifested by the patient are definitely related to and determined in large degree by his motivation. In the cases of Neurasthenia, Constitutional Psychopathy and Epilepsy, on the other hand, evidence of the motivated character and origin of the symptom is lacking. In these conditions the present clinical symptoms behave just as do the facts of history, heredity and biography, and appear to be neither more or less motivated than do these latter.

Similar results are found if, instead of classifying the questions, the total scores of the patients be considered, in the manner in which the Personal Data questionnaire was used in the recruiting service. Here the scores of an individual consisted of the total number of positive symptoms which he reported, the highest possible score being 116 points or symptoms.

Data secured from various control groups, chosen at random so far as concerns the presence of neurotic symptoms, give the following scores as a basis of comparison. The most probable score (medians) of white recruits was 10 points, college students 10 points, colored recruits 19 points.

Cases of neuro-cardiac-asthenia, psychoneurosis, and other disorders encountered in the recruiting service averaged from 30 to 40 points.

The distribution of scores of 319 cases of our own group is given in the following table. Cases arriving before and after the armistice are given separately, as well as the total distribution regardless of time of arrival. The mode for the pre-armistice group lies betwen 15 and 20 points, the median being between 20 and 25 points. The neurotic group, before the armistice, thus yields a score some two or three times as high as that of the average white recruit, and larger also than that of the colored soldier. Thirteen per cent. of the pre-armistice neurotics give scores greater than 45 points, and only about the same number score below ten points, which is the median for white recruits and college students so far as known.

The post-armistice group shows a distinctly different distribution. Nearly fifty per cent. are below 10 points, the median score lying just above that score. Considering the total group, both before and after the armistice, the median lies between 15 and 20 points,—higher than the most probable score for white recruits and lower than the most probable score for colored soldiers. The

TABLE XIV

DISTRIBUTION OF SCORES IN THE PERSONAL DATA QUESTIONNAIRE

Score	Number All Cases	Number Pre-Armistice	Number Post-Armistice
0– 5	60	10	50
5–10	49	19	30
10–15	61	8	53
15–20	33	15	18
20–25	23	11	12
25–30	24	14	10
30–35	13	8	5
35–40	9	7	2
40–45	13	10	3
45–50	18	6	12
50–55	6	5	1
55–60	5	2	3
60–65	3	1	2
Over 65	2	1	1
Total Cases	319	117	202
Median Score	15–20	20–25	10–15

striking difference between pre-armistice and post-armistice groups is another indication of the

influence of motivation. In this case the data show the effect on the total score of the individual. The data previously presented refer rather to the effect on the various types of symptom or question.

Additional evidence concerning the characteristic behavior of the different diagnostic groups results when the individuals are classified under their respective diagnoses and the median scores for these groups taken, both before and after the armistice. This evidence is shown in the following table:

TABLE XV

Diagnosis	Total Results		Pre-Armistice		Post-Armistice		Ratio of Pre to Post Armistice Scores
	Score	Cases	Score	Cases	Score	Cases	
Neurasthenia	25	29	33	13	18	16	55
Const. Psychop.	25	15	28	11	17	4	59
Psychoneurosis	18	62	25	28	12	34	.49
Ment. Defic.	16	11	21	5	10	6	48
Epilepsy	15	76	23	39	9	37	.38
Concussion	14	33	24	16	5	17	.22
Psychasthenia	12	9	42	2	13	7	.31
Hysteria	10	46	36	12	1	34	.03
Group Medians	15		26		11		

Before the armistice the scores range from 21 to 42 points for the various groups, all diagnoses thus showing median scores considerably higher than the recruit average. After the armistice, however, the scores uniformly fall so that the average recruit score is approximated in most of the cases. Neurasthenia and Constitutional Psychopathic State, however, still show high scores.

The relative amount of decline is shown in the final column of the table, where are given the ratios of post-armistice to pre-armistice scores. The most conspicuous changes are in the cases of Hysteria, Psychasthenia, Concussion and Epilepsy. In the Hysteric group indeed the median score falls practically to zero, although the pre-armistice score for Hysteria was greater than that for any group (except Psychasthenia, represented by only two cases).

In order to determine whether or not this armisticial change in inventory scores might have been conditioned in any way by a difference in the general degree of understanding and comprehension on the part of pre- and post-armistice patients, the average mental ages of all patients arriving in successive months was computed. The armistice occurred in November. The results are as follows:

TABLE XVI

Month of Arrival	Number of Cases	Average Mental Age
September	28	13.6
October	204	12.4
November	191	11.4
December	291	11.3
January	69	12.2

There is seen to be no consistent change in these measures. The somewhat higher age level of the September group is due to the fact that all but four or five of these cases were from the Cerebrospinal Meningitis group, to whom the final form of the Personal Data questionnaire was not given. It seems fair to assume that the changes in inventory scores were genuinely dependent on motivation and that the characteristically different effects of changed motivation on the various diagnostic groups is definitely related to the origin and the nature of the symptoms.

The results suggest, then, that the distinction between the "functional" and the "structural" or "organic" conditions is in reality much less sharp than it is sometimes drawn. There are

signs of degrees of functionality in this hierarchy of susceptibility to the influence of a change in motivation. Although data are lacking on the point, it is reasonable to suppose that even in the cases of purely organic injuries such a report of symptoms would have been influenced in some such way as were the C questions in the present instances, and the A and B questions in the cases of Neurasthenia, Psychopathy and Epilepsy. It is at least certain that individuals in no sense whatever incapacitated for military service reacted to the armistice with a definite impulse of motivation, an exuberance of outlook and a feeling of new life and purpose. That it has been possible here to measure the degree of this effect in the various diagnostic groups with functional disturbances is but one of the many sidelights on human nature made possible by the scientific efforts to ameliorate the warping and distorting effects of warfare on personality.

The data on the influence of motivation and the differential degrees of susceptibility to this influence shown by the various diagnostic groups bear in an important way on the general question of the theory and technique of psychotherapy, and especially on the psychoanalytic doctrines. Interpreting the psychoanalytic theory in terms of

the redintegration concept here advanced, analysis and reëducation proceed in a large part by reinstating cortical redintegration,—that is, by *reminding* the individual of the original setting of which the stimulus was a detail (discovering the complex). Thus reconstructed on the cortical level, the complex situation, in the light also of the present context, becomes the determinant of response on lower levels. Fixation through habit may still render some of the symptoms obstinate, either on the postural or the autonomic levels. But if therapy is sufficiently prolonged, and especially if the responses involved are directed into new channels, it may be entirely successful (so far as concerns the immediate symptoms). The striking thing about such symptoms is that to the patient they seem for the time being inexplicable. Naturally enough, cortical redintegration, the promotion of understanding, facilitates relief from the immediate symptom.

If now the postural and autonomic symptoms are due to the redintegrative tendency of the nervous system, and this be conceived as a constitutional characteristic, how is the therapeutic effect of changed motivation to be understood? Here there are several suggestions to be made.

In the first place the stimulating detail has

commonly been an element in several contexts. A change in motivation, with its attendant shifts of attention and plans for the future, brings to readiness redintegrative patterns other than the particular one responsible for the symptom. Thus the sound of a gun is not only a part of the battle experience; it is equally a detail of the hunting expedition, the shooting gallery, the Fourth of July celebration. The armistice, with its attendant adjustments, through the suggestion of return to civilian occupation, brings into cortical, postural and autonomic readiness entirely different sets of responses, so that the original symptoms, if entirely "functional" or *redintegrative* in character, may disappear.

In the second place some portions of the symptom picture may be due to exaggeration, capitalization, and similar mechanisms. Change in motivation removes or reduces this element and only the more fixed and crystallized features survive. Instances are not entirely lacking in which the desire for compensation on the ground of disability leaves the capitalization motive active. In such cases the symptoms may be expected to survive the armistice.

In the third place it follows, in part from the facts included in the first suggestion, that a

change in motivation changes also in an essential way the perceptual nature of many stimuli. Thus the military camp is no longer a step on the way to war but, instead, a point of demobilization, a step on the way home. It is then essentially a different stimulus. The surgeon is no longer the man who certifies one as fit for duty, but is now the official who certifies one as eligible for honorable discharge. Since the perceptual nature of the stimulating detail changes in such radical fashion, a corresponding change in the response it redintegrates is quite to be anticipated.

The concept of redintegration has then a special and practical relevance in connection with problems of therapy. The facts relating to the influence of the armistice are full of practical suggestions for psychotherapy in civil life as well. Freudian enthusiasts argue that the practical success of their technique in dispelling the particular neurotic symptom constitutes adequate proof of the correctness of their theoretical hypothesis. Freud also asserts (*Delusion and Dream*) that, if we do not adopt the concept of the efficacious unconscious, then the array of phenomena remain not understood. It is the point of the present discussion to suggest that the array of phenomena, and also the practical success of the technique, can

be understood without the assumption of the elaborate Freudian machinery. In fact, it is only if this extravagant and analogical machinery be accepted that the phenomena remain far from understood. The intricate mazes, transformations, and epicycles of the psychoanalytic dogma in its present form resemble the familiar Ptolemaic astronomy, which waited long for a simple formulation that would place the observed facts on a basis of actual understanding.

CHAPTER IX

SYSTEMATIC ADVANTAGES OF THE CONCEPT OF REDINTEGRATION

The practical usefulness of the concept of redintegration has been demonstrated in the preceding chapters by showing (a) the aptness with which the concept describes the symptoms and formulates the clinical pictures; (b) the manner in which its theoretical implications accord with the objective measurements of the various diagnostic groups; and (c) the suggestiveness with which it may be applied to the observed results and processes of motivation and recovery.

A further justification is to be found in the clearness with which this single concept synthesizes and relates the variety of concepts proposed by numerous authorities and schools. It seems worth while to devote a brief section to the exposition of this point. A full discussion would proceed by taking specific cases adduced as illustrative of the various formulations and by showing the readiness with which the concept of redintegration, as here described, comprehends the

significant details of the whole array. It seems best, however, in the present circumstances, to trust to the reader's own knowledge of the literature relating to the origin and setting of the various formulæ and mechanisms. Typical reinterpretations may thus be undertaken without the necessity of detailed examples.

We may begin with a group of concepts closely related in principle, and indicated by such terms as "displacement," "transfer of libido," "siphoning of affect" and "symbolism." According to these formulæ the emotion or interest originally belonging to a forgotten or suppressed experience or an inhibited or tabooed impulse or object, persists as detachable, efficacious, "free floating" affect. Severed from its original source, this libido is attached to some new object, person or situation, thereby being "displaced," "transferred" or "siphoned." The fear or lust or irritation occasioned by the new object thus constitutes the complaint, or at least the symptom—a phobia, perversion, aversion, tremor, agitation, anxiety, or even a violent emotional episode.

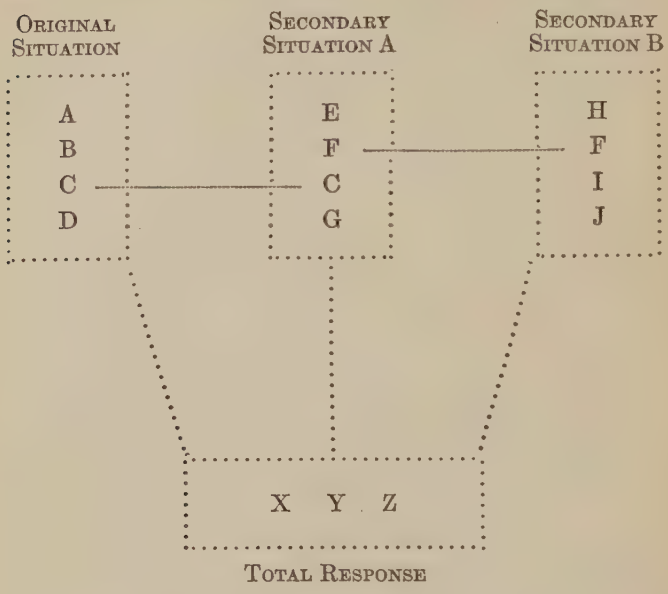
Psychoanalytic technique and exploration, assuming the doctrine of transfer, then proceeds to discover some associative resemblance, some descriptive element of similarity, contiguity, se-

quence or congruity between the old and the new object. If the objects themselves, their settings, contexts or uses, yield no such elements of partial identity, this may be sought in the verbal descriptions of the objects, in their names, or in metaphorical or analogical relationships. These tactics are familiar enough to readers of the literature of psychoanalysis.

It is clear that when these endeavors are successful they constitute perfect illustrations of the redintegrative mechanism. Some detail is sought in the new object which was also an element in the original object or stimulus. When such detail is discovered it is shown to be responsible for the revival of the original postural or autonomic response. This response or "affect" is then said to have been displaced or transferred, attached to the new object or situation as an unanalyzed whole.

A simple diagram will serve to make more obvious the minimum of mechanism involved in this process. Let ABCD represent some original situation or stimulus, the separate letters indicating the various details comprising the whole situation or object. Let XYZ represent a total response to this original complex situation. The response

may itself be described as complex, comprising the various elements represented by X, Y and Z.



A given detail of the response, as element X, may have resulted from a single stimulus detail, as A, or from a combination of several as AC, or from the total ABCD situation. And a single stimulating detail, such as B, may have been responsible for more than one element in the response, as for example YZ. But these facts have little importance. What is important is (1) that the redintegrative constitution tends there-

after to give the total response XYZ to any one of the stimulating details, as A or B or C or D, or to combinations of part of them, as BD; and (2) in the infinite variety of experience the separate details of the original situation are quite certain to be encountered, either singly or in combination, in a great many contexts.

For example, the stimulus detail C may be encountered in the new situation EFCG. When so encountered it may provoke the entire response, XYZ, previously made to ABCD. This may occur even though, in the EFCG situation or context, the C element is an insignificant item. It may, in fact, be so insignificant or irrelevant as not to be obviously present, so that its discovery may result only after careful study or analysis.

In such a case, then, the response XYZ to situation EFCG is neurotic,—the patient is "unreasonably affected" by the EFCG object, which arouses in him an inexplicable and functionally determined reaction. Abundant illustrations of such conduct have been given in chapters two and three. To say that libido has been transferred, affect siphoned, or emotion displaced, affords a dramatic albeit naïve description of the facts. Such descriptions involve numerous implications

as to the substantial and independent nature of feeling and emotion entirely unwarranted by our systematic knowledge of these processes. They are but popular figures of speech, and would better accord with our present conceptions of mental processes if preceded always by "as if." The actually observed facts are adequately expressed in terms of the redintegrated response.

There is, indeed, reason to suppose that this process of associative shifting may go even further. Thus EFCG, having provoked response XYZ by virtue of the C element therein, it may happen that on another occasion the F element alone may produce this response by reason of its having been a detail in the EFCG situation. We may thus suppose a third situation, FHIJ, provoking the redintegrated response XYZ, previously made to ABCD.

Such a series of shifts, if demonstrated, might constitute in the predisposed individual a devious series of transfers and *Wandlungen*, such as those dubiously sketched by Freud in "Totem and Taboo" and by Jung in "The Unconscious." In the case of a particular patient such a career might result in a tangled set of redintegrative patterns that would entirely justify the protracted sessions which the analyst encourages.

The concepts of "symbolism" and of "heightened suggestibility" are thus seen to fall quite within the range of the redintegrative mechanism. Preceding chapters have already suggested that the appropriateness of such concepts as "regression" and "infantilism" rests on the fact that primitive, immature and unsagacious minds are readily led astray by the redintegrative tendency. Whether the condition represents an ontogenetic level, on which the individual may become fixated or to which he may regress, must be decided, not by the convenience nor interest of the conjecture, but by the determination of facts. Such facts, if they have ever been collected, have not been convincingly set forth.

A further set of concepts to be related to the redintegrative mechanism is to be found in the formulæ of Janet,—such descriptions as "retraction of the psychic field," "inadequate psychic energy," "dissociation," "splitting of personality" and "reliving an emotional crisis." It is entirely possible to recognize the significant descriptive values of these formulæ, while yet relating them definitely to the more dynamic and effective concept of redintegration. Reduction of the field of effective stimuli is clearly present, in the sense that the whole of the present context

does not function, but only a limited perceptual detail and a definitely organized pattern of response. Inadequate psychic energy is perhaps an obscure way of expressing the lack of sagacity and the inability to bring the present context to bear on the reaction. Dissociation and splitting of personality again express the automatic character of the redintegrated reactions and the absence from them of understanding and purposiveness. The reliving of an emotional episode could perhaps be inferred only on the basis of conduct, and it is not at all unfair to describe the reintegration of a previous postural or autonomic response as a reliving of the episode, or at least as a reacting to it.

We may pass over the earlier attempts to relate the psychoneurotic conditions to organic disorders of the reproductive system and its accesory organs, and dismiss as inadequate the descriptions of these conditions as indicative merely of perversity, moral obliquity and simulation. The chief concept remaining is that of the "association reflex" or the "conditioned reflex" as described in detail by Bechterew and Pawlow and applied in a tentative fashion by numerous writers. As was intimated in an earlier chapter,

if it were not for the atmosphere of novelty and esoteric technicality with which this concept has been invested, it might be so modified and extended as to serve a useful end as a descriptive formula. Certain points in particular are to be noted.

The reactions found in the neurotic are not "reflexes" in the technical sense, nor is the process of conditioning through repeated simultaneous presentation of details required. The so-called conditioned reactions, when experimentally established, represent but a particular and limited case of the redintegrative response. It is not the presence of a conditioned reaction that constitutes the psychoneurotic. The psychoneurotic is characterized rather by a constitutional proneness toward responses of this character. It is this predisposition toward redintegrative conduct, rather than the presence of any one or more specific conditioned reactions that constitutes or characterizes what may conveniently be called the psychoneurotic constitution.

The value of the redintegrative concept depends, then, not only on its significance in the description of individual clinical pictures, the process of psychogenesis, and the influences of

motivation and therapy. The concept is justified also by the aptness with which it synthesizes and coördinates the various divergent formulations, both historical and contemporary.

CHAPTER X

IRREGULARITY OF PROFILE (SCATTERING) IN THE PSYCHONEUROTIC

A characteristic of the psychotic as distinguished from the defective and normal performance that has been pointed out by others is the more pronounced tendency to "scatter" in test scores. The defective of a nine-year mental level tends more or less consistently to yield ratings in the close neighborhood of this level in all types of performance. On the intelligence scales this lack of "scatter" shows itself by relatively abrupt failure to succeed at some narrow region of the scale. Beyond the so-called "basal age," represented by the highest year at which all tests are passed, few advance credits are gained by passing an occasional test in higher years. The psychotic picture, on the other hand, is more likely to scatter, or to vary considerably in the different types of performance, or to intermingle successes and failures over several age levels of the intelligence scale.

The miscellaneous intelligence scales, whether the scoring is conducted on a point system or by

an "all or none" basis, do not afford the best means of revealing this tendency to irregularity of performance. Numerous difficulties are encountered when an attempt is made to secure quantitative measures of this tendency as revealed by records in the present intelligence scales. A more favorable method for this purpose is found in the type of measurement here mainly reported, in which, in each type of task, the range of possible success is very great, and a given individual may in a given test score anywhere from a six or seven year level up to an adult rating. If a considerable variety of tasks are used such a method of examination gives ample opportunity for each individual to show the regularity or symmetry of his capacities. The symmetrical individual will tend to approximate in all the separate ratings, based on different tasks, his median score as based on all the findings. The individual who is irregular in his profile of abilities may, while having the same median mental age as a more symmetrical person, nevertheless attain this median through scoring very high in some tests, very low in others, and may perhaps in only a few of the types of task actually approximate his median mental age.

This is but one of the numerous reasons why the mental measurement of the future is quite certain to utilize a great many different types of test, each of which is independently standardized on an age or distribution basis, rather than the unsystematic gradations of miscellaneous tasks such as now comprise the intelligence scales based on the original Binet-Simon series. The imputation sometimes directed against the type of mental measurement here advocated, viz., that it implies a return to the abandoned conceptions of "faculty psychology" is just only when the method itself is misunderstood. The method is based on the specific character of tasks and materials, rather than on any implication of fundamental faculties. That tasks and materials may vary from each other no one will deny, whatever his attitude toward the conception of specific capacities, aptitudes, interests, and types of experience.

It is a commonplace of psychiatry that, in the case of deteriorated personalities, not all types of performance are equally disturbed. The aphasic who is unable to recall names or to speak them may have little difficulty in recognizing them when he hears or sees them. Inability to deliver the name of a tool or instrument by no means neces-

sarily implies inability to identify its use or inability to use it. Numerous studies of the insane and the epileptic report that some types of performance may suffer more notably than others, —thus memory processes may be impaired with little or less disturbance of other types of achievement. Elementary teachers will readily agree that proficiency in spelling is by no means perfectly correlated with skill in arithmetical processes. In traumatic conditions, especially in the convalescent stages, measures of speed of reaction, accuracy of perception and fineness of discrimination in the case of simple materials, immediate retention and the ability to manipulate materials which are physically present, may yield quite normal records, although recall of past experiences, understanding of complex instructions, focalization of effort and capacity for sustained exercise may be measurably and notably inferior. It is moreover entirely possible to measure the process of recovery and the restitution of function in these impaired types of ability, accompanied by no measurable change in the former characteristics.

In the case of individuals who took all five of the group survey tests a measure of tendency to scatter was derived by computing the variability

of the separate test ages from the median mental age. The larger this measure of variability the more pronounced is the unevenness of the individual's performance. The following table gives these measures of irregularity for the chief functional conditions and for the small group of mental defectives who were able to score in the group tests.

TABLE XVII

Diagnosis	Average Deviation of Separate Scores from Median Mental Age	Q	Number of Cases
Hysteria	2.0	.5	69
Epilepsy	1.8	.5	110
Concussion	1.7	.4	38
Neurasthenia	1.6	.5	43
Psychoneurosis	1.6	.3	55
Const. Psychopathy	1.4	.4	18
Mental Deficiency	.9	.3	9

The hysteric, epileptic and concussion groups show the greatest irregularity or tendency to scatter, with an average deviation of 2 years, 1.8 years, and 1.7 years respectively. Neurasthenia,

psychoneurosis and constitutional psychopathic state are somewhat less variable, the figures lying between 1.4 and 1.6 years. Least variable of all are the mental defectives, with a measure of just less than one year.

It is perhaps not fair to compare this measure, in the case of Mental Deficiency, with the measures in the case of the other diagnoses. In the first place the number of mental defectives for whom these ratings were available is very small. In the second place the deviation of .9 of a year in the case of the defectives is on the basis of an average mental age of only about 8.5 years, whereas in the other cases the measures are on the basis of average mental ages considerably higher than this. The size of the absolute measure of variation is thus in part conditioned by the average mental age differences. Perhaps all that can be safely said concerning the other conditions is that the hysterics show the greatest irregularity, the constitutional psychopaths the smallest irregularity, while the other conditions lie between these two extremes and do not differ considerably from each other.

Data are not available for comparison of these measures with those obtained in the case of normal individuals of similar mental ages. Studies

of the phenomenon of "scattering" that are reported in the literature have not followed methods directly comparable with those here used. Wallin (*Problems of Subnormality,* page 164) has reported studies of the number of "advance points" above the "basal age" earned by defectives, epileptics and insane in examinations by the early forms of the Binet-Simon scale. In the discussion of his results he writes, "It is evident that there is a large amount of scattering over the scale among the insane, just as we found to be the case among the epileptics. Apparently the scattering is somewhat greater among the epileptics, although it should be said that the wide-range method of testing could not be used as completely with all the insane as was the case with the epileptics. Whether the scattering phenomenon is more pronounced among the insane and epileptic than among feeble-minded and backward children has never been determined. . . . It is probable that scattering is a symptom of dementia." In a later article the same author writes ("Journal of Delinquency," November, 1917), "We had previously found a surprising amount of scattering . . . on the B-S scale by both epileptics and insane subjects. We now find the same phenomenon among school children only

a few of whom were epileptic or psychotic and less than one third of whom were feeble-minded. We are not yet prepared to say which class exhibits the greatest amount of scattering." Wallin found both the epileptic and the insane failing especially on two memory tests,—reproduction of a sentence and recollection of age.

In a more detailed study Pressey ("Journal of Abnormal Psychology," June, 1917) has compared a group of dementia præcox cases, a group of chronic alcoholics, a group of feeble-minded and the records of normal individuals of similar mental ages, with respect to tendency to scatter in the Yerkes-Bridges Point Scale. In comparing psychotics with defectives, for example, "if . . . a dementia præcox patient making a mental age of 11.8 on the Point Scale scored five points on test nineteen, this would be compared with the average score, 2.6, on test nineteen made by defective cases giving a mental age of 11.8. The dementia præcox is then given plus 2.4 on this test. And the algebraic sum of plus and minus variations credited the fifty dementia præcox patients on test nineteen shows the tendency of the group on this test" as compared with defectives. The results of such comparisons are expressed in per-

cents of the score with which the groups are being compared.

Comparing the præcox and alcoholics with the defectives in this way, "the interesting features of the results are the surprising difficulty (53 per cent. and 32 per cent. of the average for the primary aments) shown by both groups of psychotics in test sixteen (drawing the Binet figures from memory), and the marked superiority (155 per cent. and 187 per cent.) over the feeble-minded cases in test nineteen (defining abstract words)." The dementia præcox show a distinct, though less striking, peculiarity in their slowness of free association (the figure is 83 per cent.); the alcoholics are separated off from the dementia præcox by their more ready response to "comprehension of questions" (the scores are 119 per cent. and 98 per cent.) and to "absurdities" (the scores are 130 per cent. and 88 per cent.).

Another question considered by Pressey was "whether the psychotics showed consistent differences, as compared with the feeble-minded, in their variations from the average normal of the same mental age." In this case the three groups were compared directly with the normal records. "The feeble-minded show only one variation over 15 per cent. This is on test fourteen (making a

sentence containing Boston, money, river); their score is 73 per cent. of normal. On the other hand the dementia præcox give five such variations. They score 77 per cent. of normal on test nine (comparisons), 71 per cent. on test thirteen (free associations for three minutes), 67 per cent. on test fourteen, 54 per cent. on test sixteen (drawing Binet figures from memory), 138 per cent. on test nineteen (definition of abstract words). The alcoholics average 77 per cent. on test thirteen, 129 per cent. on test fifteen (comprehension of questions), 32 per cent. on test sixteen, 125 per cent. on test seventeen (understanding absurdities), 164 per cent. on test nineteen,—again five variations over 15 per cent. The psychotics thus show both more frequent and greater variations from the average normal of the same mental age than do the feeble-minded. Furthermore, the results from the two groups of psychotic cases agree surprisingly."

As a matter of fact the most striking thing about the results seems to the writer to be the surprisingly similar course of the variations in the different tests, when the curves for the three abnormal groups are drawn. Except for two instances the differences between the psychotic and the defective groups are in amount rather than in

direction of variation. Pressey suggests that "the distinction between true primary aments and those cases grading low because of mental disease might be made more definite, (a) by developing tests not requiring new adjustment, but rather drawing upon previous acquisitions of an adult level; (b) by setting over against these, more satisfactory tests of attention and of learning; (c) by using more tests that score procedure as well as end product."

So far as our measures of irregularity are concerned they are quite in line with those of Wallin and Pressey. The psychoneurotic show greater irregularity of performance than do the mental defectives, as do also the epileptic, and, among the psychoneurotic, only the hysteric exceed the epileptic.

Another type of information may be derived from the table of mental ages of different diagnostic groups given on page 84. Here the rating of each group in each of the six main tests is given. It is possible, by comparing the ratings of a given group in the various tests to determine those types of task in which the group tends to do well, exceeding its median mental age, and those types of task in which the rating is below the median mental age. In the following derived

table those tests in which each group clearly exceeds its median mental age are marked +, those in which it falls conspicuously below its median mental age are marked —, and those in which it approximates its median mental age are marked 0.

TABLE XVIII

	Complet.	Oppos.	Subst.	Wrd. Bldg.	Dig. Spn.	Cube Im.
Ment. Defic.....	0	—	+	0	0	—
Epilepsy.....	+	—	+	0	—	+
Hysteria.....	0	0	+	—	0	—
Psychopathy.....	0	0	+	—	+	0
Neurasthenia....	0	—	0	0	+	0
Psychoneurosis..	0	—	+	0	0	—
Concussion.....	+	0	0	0	—	0
Psychasthenia...	0	—	+	—	0	0

The comparisons afforded by this derived table are very crude, but on the whole the characteristic differences should be suggested if they are at all considerable in amount. Should one test consistently rate all groups either higher or lower than their median mental ages, this would quite probably indicate only an error in the age norms for this test. Age norms that were too low would of

course operate to score all groups relatively higher in this test than would be justified by their median ratings, while norms that were too high would have the opposite effect. As a matter of fact there is no test in the six that behaves in this way. Completion is obviously the most accurate single test, since in six of the eight groups it closely approximates the median mental age. This is in part a statistical result, inasmuch as Completion was allowed to contribute one half in the determination of final mental age. None of the diagnostic groups rate lower in Completion than they do in general.

In Opposites the defectives, epileptics, neurasthenics, psychoneurotics and psychasthenics all tend to do relatively inferior work, as compared with their general mental age. In the case of Substitution all except the neurasthenic and concussion groups tend to do relatively well. Hysterics, constitutional psychopaths and psychasthenics do inferior work in Word Building. In Digit Span constitutional psychopaths and neurasthenics do relatively well while epileptics and concussion cases do poorly. In Cube Imitation the epileptics exceed their general mental age while mental defectives, hysterics and psychoneurotics do poorly.

Considering the Defectives as a class, they do relatively well in the type of learning process involved in Substitution, failing more particularly in Opposites and Cube Imitation and approximating closely their general mental age in the other types of performance.

Epileptics fail especially in Opposites and Digit Span, and do relatively better in Completion, Substitution and Cube Imitation. In Word Building they approximate their general mental age. The Epileptics and the Defectives resemble each other closely in these respects. In three of the six tests their tendency is the same, in only one test are the tendencies opposite in sign.

The Hysteria, Psychoneurosis, Psychasthenia and Constitutional Psychopathic groups apparently belong together. They tend to be at age in Digit Span and in the language processes involved in Completion, to be above age in the learning processes involved in Substitution, and to fail especially in Word Building and Cube Imitation, which tests perhaps may be said to involve especially the ability to integrate details into a pattern or a whole. In Opposites the tendency is toward inferiority rather than excellence. In the case of none of the six tests do these four diagnostic groups have opposite signs.

In much the same way Neurasthenia and Concussion belong together. In three tests, Substitution, Word Building and Cube Imitation, essentially the learning and pattern-integrating performances, their records are identical, and approximate their general mental age. Only in the case of Digit Span are the signs opposed,—here the Neurasthenia group is superior and the Concussion group inferior to the general mental ages.

CHAPTER XI

A STATISTICAL STUDY OF PSYCHONEUROTIC SOLDIERS

A group of 1,000 consecutive cases passing through the Neuropsychiatric Hospital at Plattsburg during the period from September 1 to January 20 have been classified in various ways. It is by no means clear that these results are significant for the psychoneuroses in general, nor even for the psychoneuroses among soldiers. It is however true that this Hospital was officially designated as the one Army hospital in the United States to which functional neuroses and obscure cases of epilepsy were to be sent for further diagnosis, treatment and convalescence. In something over 150 of these cases no diagnosis had yet been finally made at the time the data were compiled, hence the figures given in the Tables do not include all of the 1,000 cases concerning whom numerous facts, including intelligence rating, were recorded. It is believed that however little or great significance these figures may have for the general problems of the psychoneuroses, they

are worth recording for purposes of comparison and subsequent reference.

Table XIX presents the frequencies of the various diagnoses, the diagnoses being in all cases

TABLE XIX

FREQUENCIES OF DIAGNOSTIC CLASSIFICATIONS

Diagnosis	First 838 neuropsychiatric cases discharged from the hospital. Single diagnosis.		Of 896 cases, double complaints being placed in both groups	
	Number	Per Cent	Number	Per Cent
Epilepsy	272	32.4	237	26.4
Hysteria	193	23.0	185	20.7
Psychoneurosis	108	12.9	128	14.3
Mental Deficiency	16	2.0	76	8.5
Neurasthenia	74	8.8	61	6.7
Constitutional Psychopathy	38	4.5	40	4.4
Concussion	22	2.6	38	4.2
Syphilitic Conditions	14	1.7	31	3.4
Cerebro-Spinal Mening	22	2.6	26	2.9
Psychasthenia	14	1.7	13	1.5
Psychosis	24	2.8	11	1.2
Enuresis	4	0.5	8	0.8
Endocrinopathy	7	0.8	7	0.8
Miscellaneous	28	3.7	35	4.2
Totals	838	100.0	896	100.0

TABLE XX

DISTRIBUTION TABLES

836 NEUROPSYCHIATRIC PATIENTS

On Basis of Age		On Basis of Education		On Basis of Rank	
Age	Frequency	Grade	Frequency		
16.....	4	Undet.	156	Privates.....703	
17.....	2	Illit.	71		
18.....	13			Privates 1 Cl.	20
19.....	28	El. 1 yr.	16		
20.....	37	2 "	24	Corporals....	54
21.....	42	3 "	31		
22.....	92	4 "	67	Sergeants....	27
23.....	92	Gr. 5	50		
24.....	86	6	56	Sergeant, 1st.	4
25.....	66	7	60		
26.....	76	8	130	2nd Lieut...	6
27.....	39	H. S. 9	46		
28.....	68	10	30	1st Lieut.....	14
29.....	39	11	17		
30.....	56	12	30	Captain.....	2
31.....	29	Col. 1	11		
32.....	20	2	11	Major.....	2
33.....	8	3	7		
34.....	8	4	10	Colonel.....	1
35.....	8	Grd. 1	3		
36.....	3	2	8	Undetermined	3
37.....	5	3	1		
38.....	4				
39.....	4				
40.....	1				
41.....	2				
42.....	2				
43.....	0				
44.....	2				

Above Tables represent compilations of all neuropsychiatric cases *discharged* from the hospital up to Jan. 1, 1919. Discharges were either on Surgeon's certificate of disability or to full or partial duty.

TABLE XXI

787 CASES ACCORDING TO OCCUPATION
(*In order of greatest frequency*)

Farmers	149	Boilermakers	5
Laborers	80	Weavers	5
Clerks	70	Stenographers	4
Machinists	45	Jewelers	4
Factory Workers	30	Bricklayers	4
Chauffeurs	23	Expressmen	4
Metal Workers	22	Shipbuilders	4
Miners	21	Messengers	3
Salesmen	21	Packers	3
Firemen	18	Printers	3
R. R. Workers	17	Grocers	3
Students	17	Newspaper Reporters	3
Automobile Mechanics	16	R. R. Conductors	2
Teamsters	14	Clergymen	2
Engineers	13	Bootblacks	2
Electricians	13	Sailors	2
Carpenters	11	Bookkeepers	2
Operators	11	Compositors	2
Business Managers	10	Chemists	2
Painters and Decorators	9	Actors	2
Drivers	8	Butchers	2
Waiters	7	Dairymen	2
Tailors	7	Wagonmakers	2
Peddlers	7	Contractors	2
Hospital Attendants	7	Surveyors	2
Musicians	7	Telegraphers	1
Plumbers	7	Street Cleaners	1
Porters and Butlers	7	Soldiers	1
Shoemakers	7	Dentists	1
Barbers	6	Stone Cutters	1
Blacksmiths	6	Fishermen	1
Merchants	6	Undertakers	1
Linemen	6	Lawyers	1
Cooks	6	Janitors	1
Teachers	6	Policemen	1
Physicians	6		

the final verdict of the examining boards. In the first two columns are given the numbers and percentages in the case of the first 838 cases (neuropsychiatric) discharged from the hospital, each diagnosis being recorded once only, this diagnosis being, in the case of each individual, the major complaint. In the third and fourth columns are given similar figures from the total of 896 diagnoses in our files. In case of two complaints the case has here been placed under both diagnostic headings.

In the cases of 836 of the neuropsychiatric patients with functional disturbances records were secured showing their age, their education, and their rank. In the case of 787 the occupation prior to enlistment was also recorded. The tables give the results of these tabulations. The table of occupations probably has no significance at all unless the relative frequency of these occupations among the male population at large is also considered. Even then the statement of a patient that he was "an engineer," "a musician," "a machinist," etc., probably has very little meaning. Certainly types of employment exceedingly diverse are included under the same caption, as further interrogation of individual cases readily revealed.

The age distribution also has very little significance as it stands, since it is complicated by the draft ages, by the relative frequencies of these ages in the population at large, etc.

It is, however, significant that 71 of these cases, or about 12 per cent., were definitely ascertained to be illiterate; 156 of them, or about 19 per cent., refused to indicate their education although specifically and personally requested to do so; and 209, or 25 per cent., of those who gave evidence of their degree of education had gone not higher than the fourth school grade. When this is taken in connection with the further fact that the average mental age of these 1,000 patients, as determined by intelligence tests, is only about 11.5 years, it is clear that the psychoneuroses found among these soldiers are closely correlated with inferior mental competence and with inferior educational achievement.

The number of officers included among the 836 cases is very small but cannot be interpreted unles the relative number of officers and enlisted men in the service is borne in mind.

Record was also made in all of these 836 cases as to whether their disability had been acquired in line of duty or had existed prior to enlistment. Only 292, or approximately 35 per cent., were

"line of duty" cases. In the remaining 65 per cent., or approximately two-thirds of the cases, the condition which led to the men's hospital residence was found to have existed "prior to enlistment."

In Table XXII the frequency of the cases from each of the States of the Union is given, expressed in actual numbers and also in relation to the total population of the State in 1910. In determining the ratio the population of the State is expressed in hundred thousands, and this figure is divided into the actual number of cases. The ratio 100 thus represents one case per hundred thousand population.

It is entirely possible that these data have no actual bearing on the incidence of psychoneuroses in the different regions. If the same proportion of men had been drawn from each region for active service, and had all begun their training at approximately the same time the figures would have had a more definite significance. As a matter of fact this was far from being the case. The high proportion of cases drawn from the eastern and southern states as compared with the western and central regions may mean merely that larger numbers of men, per unit of population, were in active service during the existence of this hos-

TABLE XXII

State	Cases	Ratio	State	Cases	Ratio
Connecticut	17	154	North Carolina	15	69
Kentucky	34	148	Arkansas	11	69
New York	118	128	Oklahoma	4	69
Indiana	33	122	New Jersey	17	68
Louisiana	33	122	Iowa	15	67
Virginia	25	119	Idaho	2	66
Massachusetts	38	112	Ohio	31	65
Alabama	23	109	Michigan	18	64
Mississippi	18	105	Tennessee	11	50
Pennsylvania	78	101	Arizona	1	50
New Hampshire	4	100	South Dakota	3	50
Kansas	11	100	Florida	3	38
Delaware	2	100	New Mexico	1	33
Minnesota	19	90	North Dakota	2	33
Wisconsin	19	83	Missouri	10	30
Illinois	45	80	Nebraska	8	25
Rhode Island	4	80	West Virginia	3	25
Maryland	10	77	California	6	25
Oregon	4	76	Texas	19	24
Montana	3	75	Maine	1	14
Utah	3	75	Washington	1	9
Vermont	3	75	Wyoming	0	0
South Carolina	11	73	Colorado	0	0
Georgia	19	73	Nevada	0	0

pital. The figures are also complicated by the fact that after the signing of the armistice there was a tendency to send invalid soldiers to hospitals situated in the general region of their homes. Data may be available at some later date which will make possible correction on the basis of these facts. Meanwhile, the figures are given as they stand and the correlations based on them are given with reservation.

The various states have been classified, on the basis of the number of cases furnished per 100,000 population, into five groups. In the first group come the ten highest states, with a median ratio of 120. In the next three groups there are also ten states each, the median ratios of the groups being 82, 69, 44, respectively. In the fifth group come the eight remaining states, with the lowest ratios, the median being 12.

In the following table these groups are indicated as I, II, III, IV and V. The median ratios of cases furnished are given, and in parallel columns of the table are given for each of the groups six other measures compiled from the U. S. Census reports (1910). The measures given are (a) median per cent. of foreign population; (b) median per cent. of illiterates over 10 years of age; (c) median density of population per square mile; (d) median ratio of urban to rural population; (e) median ratio of insane in institutions; and (f) median ratio of prisoners in penal institutions.

Examination of this rough table suggests that as the frequency of psychoneurotic cases decreases there is a parallel decrease in the percentage of illiteracy, in the density of population,

TABLE XXIII

Group	Median Ratio	Per cent Foreign	Illiteracy	Density Pop.	Ratio Urban	Ratio Insane	Ratio Prisoners
I	120	5	9	61	68	20	55
II	82	21	5	45	86	26	49
III	69	7	6	40	25	14	40
IV	44	14	4	32	37	16	47
V	12	15	4	15	71	17	65

and in the number of insane in institutions, in these groups of states.

So far as revealed by this table there is no relation between number of psychoneurotics and per cent. of foreign born population, ratio of urban population, or number of prisoners in penal institutions. It should be pointed out, however, that the medians given in this table are extremely unreliable, since the states within a given group vary a great deal from each other in any one of the characteristics.

Perhaps a more reliable method of determining such relations as these figures indicate is by computing coefficients of correlation between the various characteristics of the different states. The

following correlation coefficients result from the use of the method of rank differences.

TABLE XXIV

RATIO OF PSYCHONEUROTIC CASES TO POPULATION OF THE STATE CORRELATES WITH THE FOLLOWING FEATURES BY THE COEFFICIENTS INDICATED IN EACH CASE.

Number of Foreign Born in State	+.02
Number of Prisoners to 100,000 population	−.01
Number of Insane per 100,000 population	+.26
Percentage of Illiterates over 10 years	+.25
Ratio of Urban to Rural population	+.29
Density of Population per Sq. Mile	+.58

Only in the case of density of population is the correlation high. The denser the population the greater the ratio of psychoneurotics furnished to our group. There is no relation indicated between ratio of cases and number of foreign born. But the number of insane, number of illiterates and ratio of urban to rural population all correlate positively with median ratio of psychoneurotic cases, although the correlations are not large.

CHAPTER XII

MENTAL ABILITY AND CHRONOLOGICAL AGE IN ADULTS

In the standardization of tests of mental ability in terms of developmental units it is commonly found that with increase in chronological age, from early childhood, there is progressive increase in capacity up to a point which ranges from 10 to 16 years. This point of maximum score is taken to represent maturity in the process measured, and constitutes a sort of average physiological limit. The variation in the age of maximum score for different tests suggests that this average physiological limit is reached earlier for some types of task than for others.

Ordinarily actual measures are not made on individuals whose chronological age much exceeds this age of maximum score. It is in general taken for granted that the flattening out of the curve of average score indicates the improbability of significant changes being found in later years. The relative inacessibility of adults for experimental purposes as compared with school children

and the fact that the problems of mental measurement have been more largely studied by those primarily interested in the management of human nature in its early developmental period, have led to the experimental neglect of the adult and the senile.

Although of little pedagogical import and having perhaps no general practical bearing in human engineering, the study of mental changes in maturity and in senescence offers problems of systematic and theoretical interest. Much less is known about the maintenance and loss of mental capacity, in normal adults, than is known of its growth in children. Assertions concerning the loss or preservation of intellectual dexterity, learning capacity, retentivenes, etc., in the adult rest for the most part on inference, desultory observation, analogy, and striking clinical examples. Here, as in other fields, it should be the task of experimental psychology to substitute quantitative determinations in the place of speculation, analogy and incidental record.

In general it might be expected that the experience and occupation of adult life, in company with such physiological changes as also occur, might result in any one of three different tendencies in the case of specific mental achievements. Thus in

a "mental test" in which the score depends in part on information, knowledge of fact, vocabulary, acquaintance with general affairs, or on dexterity in simple arithmetical processes which are commonly more or less continuously employed through adult life, it would be at least "logical" to expect to find progressive increase in score as a function of chronological age, up to a relatively advanced period. The Alpha Tests used in the Army externally resemble such a type of performance to a considerable degree, and empirical evidence is also available showing uniform increase in average score in these tests, up to at least the age of forty years.

On the other hand there are "mental tests" that make but little call upon the store of knowledge and the range of general information, but which involve most exclusively those general capacities and characteristics of response underlying what we commonly call "intelligence," as distinguished from "wisdom." That there are such tests is an axiom of contemporary psychology. But an invitation to support the statement would usually be met with the conventional assertion that such and such tests, although showing progressive increase in score up to the age of about 15 years, show little or no increase at the ages of 16, 17 and 18. Actual

measures on representative adults of 25 to 50 years or beyond could in almost no single instance be submitted.

Again, it is entirely possible and in fact quite probable that in certain types of performance increase in age beyond the point of full maturity would be accompanied by progressive loss of capacity. "Learning ability" is one of the functions concerning which there has been some disagreement in this connection. Assertions that old folks cannot learn as readily as young folks are met by counter-assertions that they can learn just as easily if not indeed better. But empirical measures of learning capacity on groups of adults differing considerably in chronological age but of equal general mental capacity and motivated by incentives that are approximately equally powerful, are not known to the writer.

The measures here reported have been made on 534 male adults who, except for the fact that they all complained of functional nervous disorders, were selected only to such degree as men are selected in the military draft for service in the ranks. Gross incapacity, mental or physical, is in the main eliminated and commissioned officers are not included. The scores indicate that the group as a whole measures somewhat lower than the

average soldier, whose average mental age by existing scale units is about 14 years. The average mental age of the particular group here considered is about one year less than that of the average American soldier. The range of type was representative; the younger men ranged from ignorant boys to college students; the older men ranged from shiftless hoboes to responsible men of business, industry and the professions.

In chronological age the men were distributed from 18 to 45 years. Effort was made to secure enough records so that 50 individuals might be available at each age. With this plan circumstances so interfered that only for eight of the age levels was the number secured or approximated. For the remaining ages there are about 25 cases for each year level. It appears, however, that for the purpose of this study the cases are quite sufficient in number to give reliability to the measures.

To these 534 adults, assembled in small groups, were given five familiar mental tests, all of which are adaptable to group procedure,—Digit Span, Language Completion (Trabue Scale A), Opposites (Pintner, Pyle), Substitution (Woodworth-Wells), and Word Building (a-e-i-r-l-p). In the Digit Span test, two series of digits ranging

from 3 to 9 in number were read in the standard way, one reading for each set, the digits at one-second intervals. The score is the number of digits correctly written in both of two trials. In Completion the standard method of scoring described by Trabue was followed. In Opposites and Word Building the instructions and method of scoring described by Pintner were adopted. In Substitution the whole of the standard blank was employed, the score being the number of correct substitutions made in a two-minute period.

Table XXV gives the Median Score for each age level in each of the five tests. The median of the various age level scores is also given, with the mean variation of all the individuals from this grand median. This M. V. is thus also a fair measure of the reliability of the separate Median Scores.

The most noticeable result is that, except for Substitution, there is no change whatever in the age level scores. At 20 years and below the Median Scores in Completion are 33 and 31 points. At 45 and 35 years the scores are still 34 and 31 points. The average score for all age levels is 32 points, and this score is closely adhered to at all ages from 18 to 45 years. In Opposites an identical result is found, the average score of 12 being

TABLE XXV

INFLUENCE OF CHRONOLOGICAL AGE IN ADULTS

The Table gives for each of five Mental Tests the Median Score at each Age Level, the Number of Cases at each Level, the Final Median Score of all Age Levels, the Mean Variation about this Median.

Age Level	Number of Cases	Completion	Opposites	Substitution	Word Building	Digit Span
Below 20	25	31	12	68	10	6.0
20 years..	34	33	13	66	9	6.0
21 years..	29	32	11	64	10	5.5
22 years..	50	28	10	65	8	5.5
23 years..	50	28	12	57	7	5.0
24 years..	50	30	12	62	11	5.5
25 years..	50	32	11	63	10	5.5
26 years..	41	32	10	63	9	6.0
27 years..	34	27	10	56	8	5.0
28 years..	42	31	11	60	11	6.0
29 years..	22	32	13	60	11	5.0
30 years..	45	32	12	60	9	6.0
31 to 32..	24	33	11	58	10	6.0
33 to 35..	20	31	13	57	9	6.0
36 to 45..	18	34	12	57	12	6.0
Medians..		32	12	60	10	6.0
M. V.....		8.6	4	13	4.4	.8
P. E.....		7.2	3.4	10.9	3.7	.7

representative of all the chronological age levels. In Word Building the Median Score of 10 words is not consistently departed from at any region of the age scale. A similar result is found in Digit Span, in which the Median Score of 6 digits is characteristic of all age levels. These four tests thus illustrate the second of our three possible alternatives,—a level of capacity reached and thereafter maintained unchanged up to the extreme age level measured.

In the Substitution Test, however, the third of our three possible alternatives is realized. In this test the 18 and 20 year olds achieve scores of 68 and 66 respectively. Thereafter the scores fall in a fairly consistent fashion to 57, which represents the score of the oldest age group. From 18 to 45 years the score falls from 68 to 57, a loss of 11 points, 16 per cent. or a difference in mental age of five years (following data afforded by Pintner's standardization of the first half of this Substitution Test). Although the variability of these Substitution scores is high (the M. V. of the Median being 13 points), the consistency with which the decrease in score appears is not at all suggestive of a chance result.

If this test alone had been used it might at once have been suggested that, since these various age

groups were composed of different individuals, there was probably some selective influence operating which assembled only inferior men for the older age groups. That no such selective process is responsible for the result is shown by the fact that in the four other tests no such inferiority is indicated.

The explanation that suggests itself most readily is that Digit Span, Completion, Opposites and Word Building represent processes or types of mental work which, once matured, do not change as a function of chronological age, at least up to the 40-year period here indicated. Increasing experience, information, and longer life do not increase one's ability to score in them. Nor do the physiological processes involved in growing old dull their effectiveness. Or, perhaps, if these factors do exert influence, their effects are opposed and equal, and hence mutually compensating.

Substitution, on the other hand, would seem to represent a type of mental accomplishment which is impaired by age beyond maturity but is not improved by general experience and knowledge, or else is measurably more influenced by the former than by the latter. It is worth noticing that the Substitution Test, commonly called a "learning test," is as a matter of fact the only one of the

five tests in which immediate learning is obviously and materially concerned. One's score in this test is determined in large measure by the readiness with which new associations are established between the geometrical forms and the key numbers. It is not without justice that this test has been employed as a measure of at least a certain kind of "learning capacity." Of the other tests, the score in Digit Span depends primarily on attentive observation, auditory preservation and articulatory grouping. Completion, Opposites and Word Building involve mainly the quick and accurate manipulation of bonds already established between the items worked with. Roughly speaking Digit Span may be said to be chiefly a measure of attentive apprehension, Substitution of the ease of establishing and exercising new associative bonds, and the remaining three tests especially of that general mental dexterity more commonly designated general intelligence or mental alertness.

In so far as these measures are reliable (they are at least the only recorded observations of this character known to the writer) the evidence is that up to the age of 40 or 45 years attentive apprehension and general mental alertness do not change as a function of chronological age, but

learning capacity changes in definite and measurable degree, the relation between age and learning capacity being an inverse one.

A further point has to do with the influence of age and experience on the variability of human faculty. So long as the median score varies it is impossible to compare variabilities with any assurance. The gross measures may not be compared since these are influenced by the magnitude of the central tendencies. The use of fractional variability coefficients of whatever form involves one or another gratuitous assumption. But in the case of the groups here considered it is possible in at least four of the five tests to inquire into the influence of chronological age and its attendant factors on variability, in as much as the central tendencies do not vary with age.

The question then is simply whether, in advanced adult life, such differences as may have been displayed by the various members of a group in early maturity are enhanced (increased), obliterated (reduced), or remain unchanged. Will a group of human adults become more like each other in mental capacity as they grow older, or will they become more and more dissimilar in specified traits? In the present instance, to be sure, we do not have identical individuals at dif-

ferent ages, and this is unfortunately true of nearly all quantitative comparisons of age groups, whether juvenile or adult. But we do have fairly large experimental groups, resembling each other in average capacity, and having been selected at least without reference to the subject of our inquiry.

TABLE XXVI

VARIABILITY AT DIFFERENT CHRONOLOGICAL AGES

		Digits		Completion		Opposites		Word Building	
Age Level	Cases	M. V.	per cent.	M. V.	per cent.	M. V.	per cent.	M. V.	per cent.
Below 22..	88	.7	11.8	7.9	24.7	4.0	33.3	4.1	41.0
22 and 23..	100	.9	15.0	8.9	27.8	4.6	38.4	4.4	44.0
24 and 25..	100	.9	15.0	9.3	29.0	4.3	35.8	4.6	46.0
26 to 29..	139	.7	11.6	8.6	26.9	3.9	32.5	3.9	39.0
30 to 45..	107	.8	13.3	8.4	26.3	3.9	32.5	4.4	44.0
Averages..	(534)		13.3		26.9		34.5		42.8

In Table XXVI these 534 individuals have been arranged in five sub-groups, approximating as nearly as the facts would permit 100 cases at each age level, by combining adjacent groups. In the case of each level the variability of the individual

members of the group from the adult median has been computed for each test. The measure of variability is given not only as an absolute quantity but also as a fraction of the central tendency—a coefficient of variability. Considering each test separately, there is in no case evidence that the variability of the group is influenced in any definite and consistent way by chronological age.

A further point which has received much less attention than it intrinsically deserves has to do with the variability of human nature in respect to different traits. Detailed analysis of variability in different mental traits is contemplated in another connection. It is, however, to be observed that among these four tests the variability ranges from an M.V. of 13 per cent. of the median in Digit Span to 43 per cent. of the median in Word Building.

The possibility that the various results here presented are in one way or another conditioned by the psychoneurotic make-up of the individuals studied should not be overlooked. If any result is so conditioned it is at least in a fashion so obscure that our present knowledge of the peculiarities of such personalities throws no light on the nature of the influence.

CHAPTER XIII

RELIABILITY OF A GROUP SURVEY IN THE DETERMINATION OF MENTAL AGE

Many occasions arise in which it is desirable to secure intellectual ratings of large numbers of individuals, for which purpose the time-consuming individual method of examination, even in the abbreviated forms, is inexpedient. The individual examination usually requires from 30 minutes to an hour or more. Group survey methods have been used in such instances. The group survey tests may be so selected that, by the time limit method, a large number of individuals may be simultaneously measured. Group surveys have usually been of either of two forms. In the one form, such as that followed in the Alpha Tests of the U. S. Army, a point method of scoring is adopted, which makes it necessary that the whole system of tests be used in order for the score to be interpreted. In the second form separate tests are given independently of each other, thus making it possible to score the individual in each test separately. There is by this method no limit to

the number of tests that may be used. The time consumed may be varied to meet the necessities of the occasion. Specific measures are afforded as distinguished from final scores.

In any case it is desirable to know to what degree the group survey results agree with the results of individual examination. The limitations of survey tests are obvious. Although success in them may be taken as reliable indication of mental competence, failure may be due to a great variety of factors. Illiteracy, sensory defect, unfamiliarity with the language of the instructions, physical impediment, and psychotic conditions may, in the case of the intellectually competent, produce performance resembling that of the mentally deficient.

The present paper presents results indicating the degree of confidence that may be placed in the ratings here secured by the group survey methods. The subjects examined were all adults, presumably suffering from functional nervous disturbances. They were selected only on the basis of their being enlisted men in the army, arrived at the hospital for treatment and convalescence. In the main the subjects here considered were men whose group survey ratings were below twelve years, so that it was felt that they should be sub-

mitted to individual examination before their low ratings were attributed to mental incompetence.

The tests used in the Group Survey were five in number—Trabue Scale A, Naming Opposites, Word Building (a-e-i-r-l-p), Digit Span, Substitution (Woodworth-Wells). The group of tests required about 30 minutes, from twenty to forty individuals being examined at a time. In grading the tests Trabue's norms were used for Scale A, and in the other tests a combination of the norms given by Pyle and by Pintner. Scores were transformed into terms of mental age. The Scale A then gave half the score, and the average of the other four tests gave the other half. The final rating was the average mental age afforded by these two halves. The Trabue test, which occupied about half the time, was thus weighted accordingly.

The individual examinations always included the use of the Stanford Revision, accompanied by such Performance Tests as the case seemed to call for, and usually occupied from one and a half to two hours. The examinations (individual) were conducted by one of three or four different people, all of them competent to give such tests, and the final ratings were in every case scrutin-

ized by the writer and either approved or revised in the light of the recorded scores.

In 93 cases both the Group Survey and also the Individual Examination were given. The differences in mental age determined by the two methods are distributed as follows:

TABLE XXVII

Difference in Mental Age	Frequency	Per Cent
0 to .4 years	21	22.6
.5 to .9 "	24	25.8
1.0 to 1.4 "	13	14.0
1.5 to 1.9 "	9	9.7
2.0 to 2.4 "	11	11.8
2.5 to 2.9 "	5	5.4
3.0 to 3.4 "	5	5.4
3.5 to 3.9 "	4	4.2
Over 4.0 "	1	1.1
	Total 93	100.0

The average difference between the two determinations of mental age is 1.3 years, over 48 per cent. of the cases showing a difference of less than one year. In 90 per cent. of the cases the difference is not over 2.9 years and in over 72 per cent. of the cases the difference is not over 1.9 years. The chances that the mental age of an individual as determined by the Group Survey will or will not depart by more than one year from his mental

age as determined by Individual Examination are thus seen to be about even.

On the whole the Group Survey rating tends to be lower than that of the Individual Examination. The constant error in this direction is .9 year. In 78.5 per cent. of the cases, the error is in this direction. In general then, using the norms here indicated, the individual does about one year better when individually examined than when given the survey. Results of this character are of course influenced by the accuracy with which the tests are standardized. It seems quite likely, however, that in the present instance the result is due simply to the fact that handicaps which disqualify in the Group Survey need not interfere so definitely nor necessarily in the individual examination.

It is clear, then, that in so far as the average mental level of the group is concerned the survey method has high reliability, the general tendency being somewhat in the direction of underestimation. If, however, the individual scores are to be used in any serious way it is important that, in the case of individuals of the mental ages of those in this group, over one-fourth of the group ratings will be in error by two years or more of mental age, and that the discrepancy may range

as high as four years in occasional cases, say in about one out of every hundred.

When the discrepancies between Group Survey age and Individual Examination age are large it is of course usually true that the survey age is the lower of the two. In 23 of the 26 cases in which the difference is two years or more this is the case. In three cases only did the individual score lower in the individual rating than in the group rating, by as much as two years of mental age. Indeed it is in large measure these cases that bring the constant error up to the figure of nearly one year of underestimation by the group method.

In addition to these 93 cases examined by both methods, 47 subjects failed in the Group Survey to such a degree that it was impossible to assign them a rating on this basis, other than that of "Failure." All of these 47 cases were given individual examination. The following table shows their distribution in terms of mental age as determined individually.

In only two cases out of the 47 does an individual over 10 years of mental age fail in the Group Survey to attain a scorable record—that is in about 4 per cent. of the cases. All records were scored if the individual achieved a measur-

TABLE XXVIII

Mental Age	Frequency	Per Cent
Below 6	0	0
6.0 to 6.5	1	2.1
6.5 to 7.0	2	4.2
7.0 to 7.5	7	15.0
7.5 to 8.0	5	10.5
8.0 to 8.5	17	36.0
8.5 to 9.0	7	15.0
9.0 to 9.5	3	6.3
9.5 to 10.0	3	6.3
10.0 to 10.5	0	0
10.5 to 11.0	1	2.1
11.0 to 11.5	1	2.1
Totals	47	100.0

able result in at least two tests. Three-fourths of those who failed to achieve a scorable record in Group Survey are below 8.5 years mental age. They are thus extremely unlikely to be illiterates with high mental age, or to be in other ways incapacitated except on the basis of actual mental incompetence. For the most part those who fail completely in the Group Survey are really mental defectives of a very low grade.

The average differences between mental age by Survey and mental age by Individual Examination at the different levels is shown in the following table. The question here raised is as to

whether the Group Survey is conspicuously less reliable at one level than it is at another level of mental capacity.

TABLE XXIX

Mental Age Level	Average Difference between Survey and Individual Rating	Number of Cases
7– 8	1.3	4
8– 9	0.4	13
9–10	1.2	17
10–11	1.3	15
11–12	1.8	18
12–13	1.3	8
13–14	1.5	5
14–15	2.4	5
15–16	1.9	2
16–17	1.3	3
17–18	1.3	3
	Average...1.3	Total 93

The difference in rating by the two methods quite uniformly adheres, at all levels from 7 to 18 years of mental age, to the average difference of 1.3 years. Below 8 years and above 12 years the number of cases is small, but there is little variation from level to level. In general, then, the Group Survey is as reliable at one level of mental capacity as it is at other levels.

Pintner ("Mentality of the Dependent Child," *Journal of Ed. Psych.*, April, 1917) has compared the results of a Group Survey of 88 inmates in a

County Home with the results of individual examination of these inmates by means of the Yerkes-Bridges Point Scale. The tests used in the survey were not dissimilar to those here reported, two of them indeed being identical tests (Word Building and Opposites) and three of them being very similar (two Substitution Tests and one Rote Memory Test. In addition there were a Cancellation Test and two Directions Tests.

Summarizing the results he writes: "The mental ages as determined by the class tests are in most cases lower than those arrived at on the Yerkes Scale. In fact, there are only nine cases which test lower on the Yerkes Scale than on the class tests, that is, 79 out of the 88 cases show a somewhat higher coefficient of mental ability (C.M.A.) on the Yerkes Scale than an intelligence quotient (I.Q.) on the class tests. That the ranking of the cases is much the same by the class tests as by the Yerkes Scale is shown by the correlations. The correlations between the class tests and the Yerkes Scale of all the 88 cases together is, R, .59; r, 80, with a P.E. of about .028."

In another case Pintner (*Mental Survey,* page 60) compares the results of similar survey ratings and measurement of 48 cases by the Goddard Revision of the Binet Scale. "There were 22 cases

that tested higher on the survey tests than on the Binet; two tested exactly the same on both scales; and 24 tested higher on the Binet than on the survey tests. The average difference of the 22 testing higher on the survey tests was +2.3 years; while the average difference of the 24 testing higher on the Binet Scale was +1.1 years. This shows that the survey tests offer a greater range and particularly in the upper direction. If the individual has ability he can show it by his performance on the survey tests and attain a mental age five or six years above the Binet age. This comparison of the Binet Scale and the survey tests goes to show as the other comparisons have done, that we must not place too great reliability on the survey tests for individual purposes, but that for groups they give a fairly accurate measure of mentality.'' The results of the present investigation are in close accord with the findings reported by Pintner.

CHAPTER XIV

MENTAL MEASUREMENT, METHODS AND STANDARDS

Since those familiar with the methods of mental measurement may wish to know in detail the manner in which the ratings discussed in these chapters were secured, a description is here given of the technique adopted. In the case of the tests most used, the instructions, the mode of scoring, and the norms are given. In the case of tests used less frequently it is perhaps sufficient to indicate that the technique and methods of scoring followed as closely as possible the descriptions given in the original sources from which the norms were taken.

1.—*Alpha Tests.* These are the standard series of mental tests adopted in the examination of recruits. They were prepared especially for military use by the Sub-Committee on Methods of Examining Recruits appointed by the Psychology Committee of the National Research Council and are already well known to those familiar with the methods of psychological examination. In the very beginning of our work an attempt was made

to employ the Alpha Tests. It was at once seen that, for our purpose, they were quite unsuited. For the purposes of military selection of recruits, these tests are so constructed and standardized that few individuals with a mental age less than that of the average ten or eleven year old child are able to make a scorable record. This result is admirably adapted to the demands of the recruiting service, inasmuch as individuals who rate lower than this will on the whole be relatively few, and should be submitted, in general, to individual examination before their serviceability is determined upon. But it so happens that the inferior intellectual status of the psychoneurotic patients here dealt with was so low that this ten or eleven years limit represents their average mental age. Hence fully one half of the patients examined by the Alpha Tests were unable to make a scorable record. Since it was manifestly impossible for the one psychologist then on duty to give individual examinations to half or three-fourths of the patients, it was necessary to devise some method of group examination which would provide fairly definite ratings running considerably below the ten or eleven year limit. For this purpose a special set of tests was employed, to be next described.

2.—*Group Survey Tests.* The particular selection of tests for the Group Survey was determined by various influences. In the first place it was necessary to use such materials as could be quickly provided, since it was desired to begin work without delay. This means in the main the use of such materials as could be manufactured readily in the Curative Work Shop, using unskilled help and limited machinery. In the second place it was desired to use tests for which norms of performance, on the basis of mental age, had been established with fair reliability. In the third place, it was desired to have tests which should measure as wide as possible a range of functions. In the fourth place it was necessary to use tests which untrained helpers could score and in part interpret, and the significance of which could be readily communicated to the teachers, the reconstruction aids, nurses, and the medical staff. Finally the complete survey should if possible not require more than one hour, since a longer time was found to induce restlessness and fatigue in the case of many of the patients. Moreover, it was difficult to assemble an entire group of newly arrived patients for a longer period than one hour without interfering with other necessary work of the hospital routine.

The tests finally chosen for the Group Survey were as follows:

a—Woodworth-Wells Substitution Test
b—Naming Opposites Test (Pintner-Pyle-Whipple)
c—Word Building Test (Pintner-Pyle)
d—Memory Span for Digits
e—Completion Test (Trabue Scale A)
f—P-N Inventory (Woodworth, Personal Data Blank)

Of these six tests the Substitution, Opposites, Word Building, and Completion have been repeatedly shown to correlate with general intelligence, and fairly reliable age norms are available for them all. Moreover, the functions involved in their performance do not seem to be entirely identical, since a given individual may display special disability or aptitude in one or more of the processes. The Digit Span test was used because of the considerable number of epileptics among the patients, it having been often reported that these cases tend to show special disability in immediate retention tests. The Personal Data Blank is not designed as a measure of intellectual factors, but affords an inventory of the patient's affective, emotional, volitional and general clinical com-

plaints. The instructions and the method of scoring these tests were as follows:

The group having been assembled, either in a ward or in one of the schoolrooms, each individual was provided with a writing board and with pencil. The group were then informed that certain measurements were going to be made of their present alertness and ability, in order that the surgeons might know their state of health and the rate of the recovery. They were told that these records were to become a part of their hospital record and that every man coming to the hospital was given this kind of an examination, along with the various other examinations, such as heart and lung examination, blood tests, X-ray, etc. They were assured that there was nothing difficult about the tests and that if they would simply pay close attention to the instructions, work as rapidly and as accurately as possible, and attend only to their own work, they would find everything would go along smoothly. They were also informed of the occupational and vocational opportunities afforded by the reconstruction service during their stay in the hospital, and it was suggested that these records might be of some use in assisting them to find the kind of work for which they were best adapted. The first test blank

was then distributed, face down, and on the back each man was asked to write his name, his age, his ward number, and the degree of his education—the last year of school he had completed. All pencils were then held up until the "Ready, go" signal was given. The instructions for the first test were given and the test begun. At the close of the allotted time the signal "Stop" was given, whereupon every man turned the test blank face down, where it remained until the assistants could collect them. These having been collected, a hasty examination revealed those who had been unable to write their names, etc. If this had been because of inability, such as might arise from tremor, deafness, illiteracy, feeble-mindedness, etc., the individual was excused from the group and subsequently given an individual examination. The number of individuals so excused ranged from five to twenty per cent. of the various groups. The tests were given in the order in which they are hereafter described.

a—*Substitution.* Use the whole Woodworth-Wells blank. Place the blank face down. Hold up a sample before the group and say: "Here you see a great many different shapes. Each of these shapes has a number. Up here it shows you what number belongs in each shape. Take this

first shape (subjects now turn over their blanks so as to look). What number belongs in this first place? That's right. Now take this very last one: what number goes in it? Yes. Now do you understand? You are to write in each shape the number that belongs there, just as it shows you up here at the top. Begin with the first and take each one as you come to it, going right across the page, and put the right number in each. I am going to give you *two minutes* and I want to see how many you can do in that time. Ready, go."

The score is the number of substitutions correctly made in two minutes. Pintner gives norms for this test, using only the first half of the sheet, and scoring the time required to finish. In order to make this a group test we transformed Pintner's norms into terms of the number that would have been done at each age in two minutes. Certain assumptions are of course involved in making this direct transformation, but the comparison of groups scored in this manner and measured with other tests suggests that the modification was not unfair.

b—*Opposites.* Standard list beginning "Good, Outside, Quick." "When you turn the paper over you will find on the other side a list of words, with an empty space for you to write something beside

each word. You are to write beside each word some word that means just the opposite of the word you find. If the first word is 'long,' what will you write? Yes. If the next word is 'up,' what will you write? Yes. Now do you understand? If you cannot think of a word right away, just go on to the next. I want to see how many you can do in *one minute*. Ready, go."

The score is the number of correct opposites, giving credit for every word that could possibly be considered an opposite of a test word, except that adverbs or nouns are not credited for adjectives, nor adjectives for nouns.

c—*Word Building*. Standard A-E-I-R-L-P Test Blank. Put the blank face up before the patient. "You see these letters at the top of the page, A-E-I-R-L-P. You can make words out of those letters. For example you can say E-A-R 'ear,' and that is a word. But could you say R-A-T 'rat'? No, because there is no T there. Could you say P-I-L-L 'pill?' No, because there is only one L. Do not use any letter that is not there. Do not use the same letter more than once in the same word. I want to see how many words you can make in *five minutes*. Write them on the paper. Do you all understand? Ready, go."

The score is the number of words correct, and

correctly spelled, excluding obsolete and foreign words and abbreviations. About sixty words are possible.

d—*Digit Span.* Standard Lists of Digits. "Listen carefully. I am going to say some easy numbers, and when I have finished with one set I want you to write them on the paper I have given you, putting one number after the other, right across the page. Thus if I say 2-8-3, you would write them 2-8-3." The standard lists are then given, beginning with the set of three digits and continuing to nine digits, thus completing the first series. Then the second series is given in the same way. Repeat the digits clearly, without accent or rhythm, at the standard rate of one a second.

The score is the highest number of digits that can be correctly remembered in both of two trials, providing the subject does not fail in easier sets. If he fails in but one lower span he is given credit for the span just below that one which he twice had correct. In referring to the norms for mental age, on this basis, the individual is given credit for the highest age to which his score is accredited.

e—*Completion.* Trabue Scale A. "See what it says at the top of the page—'On each blank write

the word which makes the best meaning. Only one word on each blank.' Wherever there is a blank some word has been left out. You are to write the proper word in each place so that there would be a good meaning (illustrate using first sentence). When there are two blanks you must use two words. Do as many of them as you can. You are going to have *twenty minutes* for this, and I want to see how far you can get."

The score is the total number of points. Grade each sentence 2, 1 or 0, giving 2 for a perfect meaning, 1 for an inferior but acceptable meaning, and 0 for failure, or incompleteness, or meaninglessness. Ignore spelling.

f—*P-N Inventory.* Standard Woodworth Personal Data Blank. "Here are a great many questions about how you are or how you feel. You are to answer each question by either YES or NO. After each question YES-NO is printed. Read the question, decide whether your answer is Yes or No. If your answer is Yes, draw a line *under* the YES. If your answer is No, draw a line *under* the NO. Draw the line under the answer which you mean. If you wish to make fuller explanation of some of your answers you will find plenty of space for this on the back page, where you can write anything more that you think may

help the doctors to understand your case." Allow all the time that is required. Each man may be dismissed from the group when he has finished this last blank, so that his restlessness does not disturb those who have not finished.

3.—*Individual Examinations.* In the case of individual examinations a great many different tests were employed from time to time. Some were introduced as soon as they could be secured. Others were introduced only for cases for which they seemed especially adapted. Some were used in the later days, when many examiners were available for individual work, because of personal experience or partiality. The number of individual tests used in a given examination depended on numerous factors, such as the purpose of the examination, the type of report desired, the degree of intelligence displayed, the obscurity of the case, special interest in the case, the competence of the examiner, etc. So far as the use of intelligence scales is concerned, the Stanford Revision was used throughout, by all examiners, except in very few instances where an examiner more familiar with the Point Scale of Yerkes-Bridges was allowed to use this system. The following Instruction Sheet for Examiners will suggest the

general method of individual examination employed.

INSTRUCTIONS FOR EXAMINERS

1. The following instructions should be observed carefully by all who give mental examinations in the psychological laboratory. Each examiner should be provided with a Standard Table, giving the Normal Performance at each age for a considerable number of tests, and with the typewritten Examiner's Guide, containing explicit instructions for administering and scoring individual tests.

2. First consult the File, in order to see whether the patient has taken the Group Survey Tests. If he has, copy off his ratings complete, and take advantage of the suggestions afforded by the ratings. After the Individual Examination is completed, add the records to the File Record for the individual.

3. If the patient is able to read and write (SEE THE LITTLE BOY) begin with the Substitution Test. This is concrete, interesting, requires but a short time, and it gives a very suggestive indication of the probable degree of capacity. Use the individual method, not the group method here.

Then take the Stanford Revision, beginning at the age indicated by the patient's score in the Substitution Test. Work backward until an age level is reached at which all the tests are passed, and forward to an age at which none of the tests are passed. Then, in the standard way, compute the Mental Age. Write out in full the patient's reply to every question, so that another person might be able to determine the Mental Age from the Record Sheet alone.

Then take any other Performance Tests, as many as time and the patient's condition allow, so as to give as full as possible an account of the individual's characteristics.

On the Observation Sheet, write comments and observations relating to the patient's attitude, bearing, method of work, and the general impression he gives. Include this sheet and also the Substitution Sheet and any other printed test blanks used, inside the Stanford Record Blank. Secure Biographical Data called for on the first page of this Record.

Deliver all records to the Chief Psychologist, who will make the final report.

4. If the patient is recorded as "Illiterate" in the File, or if he cannot read and write (SEE THE LITTLE BOY) or if he has difficulty in

understanding or speaking English, begin with the Performance Tests, as follows:

Begin with the Cube Imitation, which is concrete, interesting, and gives a suggestive indication of degree of capacity. Then give the Profile, and if failure results, the Manikin. Then use in turn the Diagonal Test, the Healy A Test, or the Triangle Test. If the Picture Completion is available or not in use by others, use it at this point. The Seguin Form Board may be used in place of one of the smaller form-board tests. Then give the Digit Span in the prescribed manner. If the patient is found able to write simple numbers, such as those used in the Digit Span, next use the Substitution Test, individual method, taking care to preserve the test sheet.

At this point take the Stanford Revision, beginning at the approximate age as indicated by the foregoing tests. Use only the starred tests at each age level. Proceed back to an age at which all tests are passed, and forward to an age where none are passed. Record the patient's replies in his own words. In extreme cases it may not be possible to use the Stanford at all. In such cases the Performance Tests should be as numerous as possible.

On an Observation Sheet write appropriate re-

marks and comments. Place all separate sheets inside the Stanford Revision or folded inside the Substitution Blank.

Deliver all records to the Chief Psychologist, who will make the final report.

4. *Standards and Age Norms.* The norms used in the case of the Substitution Test, when used by Group Procedure, have already been described. When this test was used individually the norms given by Pintner and Patterson ("A Scale of Performance Tests") were used in their original form. For Opposites, the norms given by Pyle were averaged with those given by Pintner ("The Mental Survey") and the results used as the most probable standards. This same method was used in the case of the Word Building Test. In Digit Span, the norms given in the Stanford Revision were adopted, but since the test, as used, was a written test and since two correct trials were required instead of one, as in the Stanford Revision, the individual was given credit for the highest age for which the span is accredited. By this method it was found that the Digit Span age for all groups of subjects tallied very closely with their mental age as determined by other tests. The agreement of the group medians seemed to justify the use of this method of scoring

in the case of individuals. In the Completion Test the norms given by Trabue were employed ("Completion Test Language Scales"). The other Performance Tests were used in the manner described by Pintner and Patterson, and their norms were adopted in the scoring. For other special tests, norms given in the sources were followed.

5. *Mode of Report.* The accompanying Psychological Laboratory Report sheet shows the form finally adopted for record and report. The various tests employed are enumerated here, with places for convenient recording and scoring, and for certain other data. By no means were all of the tests here indicated used on any single individual. The left hand half of the sheet is used for recording such tests as are standardized in terms of mental age. On the right hand half are given, in the main, tests standardized on a percentile basis for educated adults (college freshmen). These tests and scores were used only in special research cases and in cases in which individuals of normal or superior adult capacity were examined for more detailed analysis. This half of the record blank also provides a place for recording certain other measurements, such as those of physical traits, and the four special measures at

the top of the right hand half. On the back of the sheet, space was provided for general comments, remarks and summary, under special headings.

For a certain number of special cases, in which the results were desired in a particularly definite and concrete form, a type of psychographic chart was prepared, in which mental age ratings in various tests could be graphically represented. Such devices are especially useful in showing regularity or irregularity of capacity, special aptitudes and disabilities, etc. In the accompanying Psychographic Charts the case of an individual is indicated in which there was marked scattering or irregularity of capacity in different types of performance; this case may be compared with the second case given, one of simple mental deficiency, in which the degree of scattering is characteristically much less pronounced.

PSYCHOLOGICAL LABORATORY REPORT

Name	Chron. Age
Address	Mental Age
Complaint	Int. Quot.
Diagnosis	Education
Date	Examiner

TEST	Score	Grade	Year	TEST	Score	P. E. plus minus	Per-centile
Alpha Tests..				Community Ideas			
Beta Tests....				H-S Frequency...			
Point Scale...				P-N Inventory...			
Stanford Scale				Trade Test.....			
Analogies.....				Analogies.....			
Cancellation..				Cancellation.....			
Completion...				Checking.....			
Construction..				Color Naming....			
Cube Imitation				Completion.....			
Digit Span...				Construction....			
Information...				Coördination.....			
Manikin.....				Cube Imitation...			
Naming.....				Digit Span.....			
Opposites.....				Directions.....			
Part-Whole...				Information.....			
Picture.....				Learning.....			
Profile.....				Naming.....			
Seguin.....				Opposites.....			
Substitution..				Substitution.....			
Syllables.....				Tapping.....			
Tapping.....				Verb-Object.....			
Vocabulary...				Vocabulary.....			
Word Building				Word Building...			
Arithmetic....				Height.....			
Composition..				Weight.....			
Drawing.....				Grip.....			
Handwriting..				Vital Capacity...			
Reading.....				Vision.....			
Spelling.....				Hearing.....			

REMARKS AND SUMMARY

On this side of the page the examiner should record observations and comments relating to any of the following points:

1. The individual's bearing, coöperation and general attitude.

2. The individual's emotional reactions, interests, instinctive tendencies, fundamental trends and broad characteristics.

3. The individual's social, economic, religious, and sexual relations and adjustments, personal conflicts, worries, fears, etc.

4. Specific complaints, idiosyncrasies of behavior, significant symptoms and peculiarities of thought and conduct.

5. Particular physical, neurological and psychiatric indications, especially in case no neuro-psychiatric examination or record is available.

6. Final summary of psychological findings and interpretation, with such recommendation as to action, treatment, disposition, or further examination as the findings seem to justify.

CHAPTER XV

PSYCHOLOGICAL SERVICE IN A NEUROPSYCHIATRIC HOSPITAL

The function of the reconstruction service in a neuropsychiatric hospital differs essentially from the function of similar agencies in orthopedic and surgical hospitals, in hospitals for the blind, the deaf, the tubercular, etc. This function is both wider and more comprehensive in its application; it is by no means easy of execution; and the relative importance of the psychological features of the service is appreciably greater.

In the case of soldiers especially, the patient who has lost arm, leg, or eye, is clearly not fit for further service, and this fact is apparent both to the medical and reconstruction staff and to the patient himself. His diagnosis is easy and his treatment is straightforward. The period of his detention is fairly determinable and communicable. His need of rehabilitation and vocational adjustment is obvious, both to himself and to those in charge of him, and it is relatively easy to arouse in him an urge toward bodily and economic re-

covery. Physical injury, moreover, does not selectively affect those whose antecedent personality is either inadequate or maladjusted.

In the case of the neuropsychiatric patient, on the other hand, the situation is entirely different. His complaint may be obscure and his diagnosis is difficult. He may require a considerable period of ward observation and the coöperation of numerous specialists. His treatment is both difficult and devious. The fact and nature of his ailment may not be obvious either to himself or to his associates and family. His fitness for further service cannot be hastily determined. His period of detention is uncertain in length and is commonly felt by the patient to be unreasonably long. His need of rehabilitation, especially in the case of the constitutional and functional conditions, may be far from obvious both to himself and to his family. The problems involved in his rehabilitation are difficult and call for the exercise of expert knowledge, since they relate not merely to a single organ or member, but in many cases to the personality as a whole, and to complicated constitutional traits rather than to localizable and episodic injuries. Moreover, neuropsychiatric ailments selectively affect those whose antecedent personality is either inadequate or maladjusted, and hence the

very material of reconstruction presents inherent obstacles.

As a result of these various factors, in a military hospital, where detentions are not voluntary, and especially in a hospital for functional conditions as distinguished from the psychoses or insanities, a recognizable atmosphere develops, which combines with the original mental make-up of the incoming or resident patient to produce an attitude of indifference or of overt hostility. There is an indefiniteness of personal aim and endeavor and a general resistance to diagnosis, treatment and rehabilitation. This atmosphere is particularly conspicuous while war activities are still in progress. Upon the signing of an armistice the resistance is tempered by impatience and protest. Such conditions are favored by the well recognized mental factors which in many cases either produce or direct the present picture or the special and acute symptoms of the patient.

These facts call for a psychological and reconstruction service of a special character, just as the medical, administrative, and disciplinary services must also be of a special type. In the following paragraphs an attempt will be made to give a brief statement of the main features of such an adapted service. These suggestions are based on active

and arduous service for half a year in the wards, laboratory, staff meetings and in the curative work-shop and schools of the neuropsychiatric hospital at Plattsburg Barracks, New York, U. S. A. General Hospital No. 30, where every possible opportunity was found for observation, contact and practice. In all of the following directions the psychological service found useful work.

1.—*Assistance in diagnosis and classification* of patients on their reception or during ward observation, in the endeavor to complete the picture of the patient's past and present mental status. This technical laboratory service requires the assistance of psychological examiners skilled in the use of the methods of mental measurement, the various types of intelligence rating and the evaluation of their results, familiar with the typical clinical reactions to such technical procedures, and competent to conduct qualitative analysis of the mental make-up and background. Cases are referred constantly and in considerable numbers to the psychological laboratory for examination, report, and recommendation. Experience soon demonstrates the definite value of this feature of the service. Information thus acquired serves many useful purposes in the conduct of the hospital, and is often referred to or called for in connec-

tion with discipline, disposition, court martial, assignment to local duty or to general service.

The method employed at Plattsburg was as follows: A few days after the arrival of a group of patients at the hospital, they were assembled, provided with the necessary materials, and given an intelligence examination made up of specially adapted mental tests which were suitable for group procedure. This enabled the examiner to state with approximate accuracy the general intelligence level of each individual. Patients failing in this group survey to make a creditable showing were subsequently submitted to individual examination by more detailed methods. For the purpose of recording and reporting the results of these examinations the Record Blank shown on page 227 was devised. The Record Blank shows the numerous types of test employed, the data afforded, and the various methods of report.

Copies of all ratings were at once sent to the chief of the neuropsychiatric service and the psychological report was filed as an essential part of the clinical record of each patient. Duplicate copies were also sent to the placement office of the educational service, and when a patient was referred there for work in the shops or schools this rating facilitated his speedy assignment and was

an influential factor in determining the advice given him. Proper assignment means ready adjustment, keener interest, and useful occupation. Malpractice is perhaps as common in education as in medicine, and the presence of these psychological analyses was a useful preventive against educational malpractice.

2.—*Investigation and Research.* In this connection also valuable aid may be rendered the psychiatrist, through the conduct of investigation and research leading to a fuller knowledge of the nature and of the process of effective diagnosis of neuropsychiatric conditions. Thus the figures show that the soldier of average intelligence does not tend to come to the hospital for functional conditions. The patients are either (and very largely) inferior in mental capacity, or they are (in fewer instances) of relatively superior intelligence. The significance of this fact in the explanation of the psychoneuroses only further study can make clear. But it is obvious that, aside from the practical advantages of the psychological ratings, light may be thrown on the nature of the factors responsible for the breakdown of these patients as well.

It is especially important to note that if such psychological examinations had been carefully

adopted on the entrance of these men into service, fully 50 per cent. of them would never have been allowed to encumber the service with their inadequacies, the hospitals with their care, and the administration with their supervision, maintenance, discipline, and transportation.

Study of such ratings shows also that the diagnostic groups tend to show rather clear cut differences in intelligence level. In the case of the Plattsburg patients there were nine chief diagnostic groups. These groups differ strikingly in mental endowment, the ratings ranging from 8.5 years of mental age, in the case of the Mentally Deficient, to 15 years in the case of Cerebrospinal Meningitis Residuals. The characteristic type of person who is diagnosed as a case of Concussion represents the average soldier. Those who show Hysteria, Epilepsy, and Neurasthenia are distinctly inferior to the average, while the cases of Psychasthenia and Cerebrospinal Meningitis rate higher than the average soldier. If it should be finally shown that the degree of intelligence is a factor in determining the type of psychoneuroses likely to develop, this finding will have an interesting significance in the general theory of the psychoneuroses, as well as in their detection and treatment.

3.—*Assistance in Replacement or Discharge of Patients.* The Surgeon General's Office suggests specific qualifications for men fit for regular duty, for service organizations and domestic duty, for rejection and discharge. The Adjutant General's Office, through its Personnel Division, prescribes standards of skill for the various military services and occupations, and especially desires a speedy recognition of men possessing particular occupational and technical abilities. Special standardized tests are available for these cases, which require expert skill in their administration and interpretation. It has been possible to advise such replacement of convalescent or recovered men in branches of the service for which the after effects of their illness do not incapacitate them.

In cases of proposed discharge for disability, the intelligence examination also frequently contributes materially toward a just verdict, and it is often desirable to have the medical recommendation fully supported by objective measurement and precise statement. Numerous disciplinary cases encountered in the administration of neuro-psychiatric patients also call for measurements calculated to reveal the patient's degree of understanding and responsibility. Cases of such character, relating either to discharge or to dis-

cipline, are frequently referred to the laboratory.

4.—*Graphic and Pedagogic Assistance in Physiotherapy.* Here there are two chief types of assistance to be rendered by the psychological service.

(a) The beneficent results of physiotherapy and mechanotherapy may be concretely and quantitatively portrayed through the repeated measurement of functional capacity and the recording of these capacity tests by graphic methods. Two purposes are thus served. First, since the beneficial results are in many cases slow and gradual, the patient's attitude toward his own condition is usefully improved by picturing to him concretely the actual increments of functional restoration from day to day. This change in attitude from hopelessness and resistance to interested expectation is an important adjunct in therapy. Through such devices patients have been seen to develop incentive and confidence in the methods, and even to begin to compete with each other, and with their own previous records, in the use of their paralyzed limbs. In the second place, these tests have a definite value to the physician and may be made to constitute a useful part of his record. They show the actual rate and conditions of change, as these parallel the treatment,

the relative efficacy and promptness of different techniques, etc.

(b) It is to be further noted that in an overcrowded physiotherapy department the results of the mental examinations may be of practical value in determining the selection and order of patients for whom such intensive treatment may be most wisely undertaken. Other things being equal, it seems reasonable that the intensive treatment of the moron should not be allowed to interfere with or delay the restitution of function in the soldier of superior ability and usefulness in the service. It is hardly necessary to point out that work of this character is arduous and exacting in its demands on the patience, ingenuity, and tact of the recorder, and that the useful, practical and scientific results which the work can be made to yield make it urgent that high grade educational psychologists be available for their effective accomplishment.

5.—*Direction of Occupational Therapy.* For all or nearly all neuropsychiatric patients occupation serves a useful function, and in a certain proportion of cases it has a definite therapeutic value. In its diversional aspects it relieves the monotony and discontent of ward life, both in the relatively few cases of bed patients and in the more common

neuropsychiatric cases in which the patient is not confined to bed but simply detained for observation, with time heavy on his hands. Diversional activity takes attention away from symptoms, side-tracks introversion, relieves irritation, and improves the general morale. In its occupational aspect, represented by more vigorous work in the shop or school, on farm or garden, etc., it affords general activity and exercise, encourages confidence and stability, promotes the general physical tone of the body, and lends definiteness and system to the patient's attitude. In its specific functional aspects, work may be intelligently directed, in the case of the psychoneuroses, toward the restoration of particular members, functions or muscle groups. Active function is demonstrably more effective than passive manipulation, both physiologically and pedagogically. Under the advice of the psychologist the patient's work may be intelligently related to his aptitudes, his interests, as well as to his functional requirements. Instances are frequent in the curative work shops and schools in which this type of activity has yielded recognizable benefit in cases of specialized functional impairment. The contracted or paralyzed member is unwittingly brought into play when attention is centered on some project rather

than on the member itself. Gradually it comes to be more and more employed in this unwitting fashion until its function is seen to be increasingly under voluntary control as well. The general tremor often ceases when the patient is intent upon a piece of work rather than on himself and his special symptoms. By gradually leading the patient from projects which thus unwittingly bring into play the disturbed or lost functions to operations which more and more involve their deliberate control, it is possible in many cases to establish permanence of function in the previously dissociated organ or muscle group. Similarly the patient who is disturbed by noises is allowed first to make noises of his own as a part of his occupational activity. It is easier to adapt one's self to noises that are self produced, just as it is more difficult to tickle oneself by one's own movements. Gradually this adaptation to self-produced noises enables the patient to become adapted to noises that come in more unexpected fashion and that do not originate from his own activity.

6.—*Vocational Adjustment.* Although probably by no means as important as in the orthopedic and surgical hospital, and in hospitals for the blind, deaf, tubercular, etc., the vocational ad-

justment of patients with functional neuroses is worthy of serious and expert attention. Even in cases in which the condition has existed for many years, a distinct social gain is afforded by such vocational adjustment as it is possible to initiate in the curative work shop and schools. Some patients will find it expedient to modify their vocational activity, and occasional cases will need to change entirely their occupation. Such circumstances have been observed in many cases and the individuals assisted. During their detention in the hospital such patients can be usefully assisted by a competent vocational psychologist in beginning a readaptation to economic and social life which is best suited to their general capacity, their special aptitudes, their interests, their experience, and their prospects. In the work shop and schools, although it will be impossible for such a patient to complete his occupational training in most instances, a beginning may be made and a definite direction given to his later adjustments. Enough has been observed to suggest the material social and personal value of such vocational inventory and advice.

It is undoubtedly true that in many of these patients the condition found is essentially one of maladjustment. In many cases domestic and oc-

cupational factors are involved in this maladjustment. The patient's occupational and economic status are not satisfying, or the work in which he is engaged is not in harmony with his interests, his fundamental trends and his aptitudes. Often, as a result of war experience, it is necessary for him to effect radical changes in these respects. Thus one patient who possessed striking musical ability, had never known it, and had always worked as a tailor. The revelation of his musical capacity and the cultivation of this during his stay at the hospital, while it by no means cured him or enabled him to change his profession, did nevertheless assist to change him from a brooding, moody and suicidal personality into a cheerful, companionable patient. He was able to attend faithfully to his instruction in music, spent most of his time at this work, instead of in complaining, and thereby facilitated his own recovery and grip on life. Another patient who had never had a definite aim in life, was shown to have a special aptitude for typesetting, and when he left the hospital he had become an efficient and ambitious printer.

Such work as this may properly be called psychological, since it depends for its success on the careful inventory of the individual's aptitudes,

and the adjustment of his vocational endeavors in the light of these aptitudes. And since maladjustment is a striking feature of the psychoneurotic individual, this readjustment may be said to represent a useful application of psychology in psychiatry.

7.—*Educational Diagnosis and Guidance.* Perhaps the most surprising thing encountered in the first immediate contact with the mental qualities of the neuropsychiatric soldier is the high frequency of illiteracy and educational poverty. Numerous patients at the army hospitals receive their first instruction in the common school subjects. Many others take advantage of their vacant hours to improve their educational equipment in general fields, and especially in commercial branches. The speedy diagnosis of the patient's present educational status, his direction toward the most profitable lines of instruction, and the adaptation of methods of teaching the elementary, common and commercial subjects to adult patients —all these call for psychological and educational work of definite and expert character.

When the writer entered the reconstruction service he found teachers struggling to teach stenography to men who could not spell, bookkeeping to men who could scarcely do simple sums

in arithmetic, and typewriting and history to men with a mental age of seven and eight years. Obviously this is no way to bring about effective adjustment to life. Educational measurement and educational psychology were at once introduced. The ambitious stenographer was shown that the reason he could not progress in his work was because he could not spell. Thereupon he undertook spelling along with his shorthand. His interest and initiative were thus preserved and his actual adjustment much facilitated. Similar adjustments were made with patient after patient, and by means of such individual attention it was possible to place pupils in the reconstruction service in such manner that their aptitudes might be best capitalized, their enthusiasm strengthened, and their therapy and morale thereby improved. Occupation, as an aid in the reëducation of the neuropsychiatric patient, should certainly be encouraged, but only when such occupation is so directed that real improvement may be made, genuine interest maintained, and the individual's attention deflected from his complaints to his accomplishments. This is possible only after a careful psychological inventory of the patient's capacities and disabilities.

8.—*Personal Efficiency Instruction and Morale.*

It is the writer's experience that among neuropsychiatric patients there are a limited number of individuals whose adaptation to life, both in military and civil relations, may be materially improved by instruction and example in the general principles of effective mental effort and work. The psychology of learning, work, skill, habit, incentive, purpose, mental hygiene, etc., may be presented to selected groups of these men in such positive and lucid fashion that an appreciable change in attitude may result. At any rate the experiment is always eminently worth the time and energy involved in its trial.

The problem of directing the hospital morale hinges largely on these possibilities. Formal and hortatory lectures and sermons on the topics suggested are found in practice to be less effective than the use of demonstration, concrete example, the stimulation of a certain group contagion, indirect suggestion, and similar devices familiar to the social and industrial psychologist. Perhaps the most effective of these devices was found to be the local recognition of desirable enterprise by a bonus of privilege, some symbol of group approval, or a membership card to the club room, recreation room, etc.

The establishment of regular and healthy habits

follows: Writing center was intact. Could copy printing, write name, write written instructions, numbers, words, and forms. Auditory center slightly disturbed. Could understand meaning of sounds, obey simple directions (point to nose) and respond to questions. Could not indicate objects when name was spoken except when attention had been definitely drawn to context within which objects occurred. Visual center intact, could indicate objects when name was shown. Understood written instructions, abbreviations (Y. M. C. A., etc.) and evidently could read letters. Motor speech center partly disturbed. Could talk from central stimulation easily, with exception of names of objects and places, for which "seriat" or "fear" would be substituted. Main defect seemed to be, in fact, that he could not read aloud, could not repeat anything said to him, could not identify or name objects from auditory stimulus. Vocal automatism substituted for names in speaking.

Training.—Subject worked with one hour morning and afternoon. A group of sixteen objects was selected, each of which was familiar to the subject, but which he could not identify when the names were spoken. The names were repeated, the objects shown, and in half the cases the printed names also were used in training. He

soon learned to identify them when names were spoken, but could not readily learn to repeat the names. Later found that he could say "one" and "two" when the numbers were printed. Using this as a lead he was taught to say all the numbers, the letters of the alphabet, and later simple words and sentences. By this method he learned the names of the objects that he had been previously unable to acquire.

Present Results.—He can now repeat about fifteen words when he sees them printed, can read half a page of closely typewritten matter when each word is repeated for him. It is suggested that if such training is continued he can be taught to read aloud, to repeat what is said to him, and thus overcome the major part of his trouble at least. The treatment of J—— McK—— by this method of psychological direction, is still in progress on the date of this report, which is dated only about a week after the beginning of the reëducational process.

Case of J—— S——.

Condition.—J—— S—— was sent to the laboratory for a mental test. He was found to be very much depressed, unable to name objects, to state his company or regiment or former occupation, or, in general, to use any nouns. He seemed to

have a strong conviction of his inability to do these things and although he seemed willing to try he was actually unable. He recognized the correct use of objects and could repeat words after they were spoken to him. He could not read words from the printed page, but could find words on the page when they were called out to him. Could not read sentences, repeat sentences, nor write from dictation, although he was able to copy script. His clinical history gave a diagnosis of aphasia, apparently following his recovery from pneumonia in a base hospital in France in October.

Training.—Attempt has been made, in regular sittings during the past week, to see whether it might be possible to restore his confidence in himself and to effect any general or special improvement by psychologically directed special training. Meanwhile occasion is taken to collect data calculated to throw more light on the nature of his disability, which does not resemble an ordinary organic aphasia very closely. By diverting him from the main purpose and by eliciting spontaneous comments from him during the course of a game of checkers or cards, he is being successfully relieved of his self consciousness. By practicing saying the same things on successive days and by

practicing writing the same things from day to day, it has been possible to show him concretely the improvement he is making.

Present Results.—His attitude has changed remarkably during the week. Instead of going about with eyes fastened on the ground, with an expression of sadness and immobility, he looks up and laughs, appears interested. He will now volunteer conversation about himself, still halting and lacking the use of many terms. But instead of always saying, "I can't" in a depressed way, he frequently says, "I'll try" or "Just a minute and I'll get it" or "Perhaps I can tell you tomorrow." He has gained enough initiative to get his friends to write two letters home for him (the first since his illness five months ago), to send a money order home, and to be willing to make efforts to practice writing so as to be able to write a letter himself. Objectively he has gained the ability to name common objects with few errors, to repeat sentences heard if they are short, to read consecutively with help on some words, to write from dictation a word or a letter at a time, with scarcely any visual aids. He has also recalled a few words out of his past without any assistance. Being shown his daily improvement he admits that he is better than he was and that

he may improve still more. That is to say, he is on the road to restored confidence in himself and perhaps to considerable or even entire functional restoration.

10.—*Special Experimental Technique.* The usefulness of special experimental technique of a psychological type in connection with the care and treatment of neuropsychiatric patients is illustrated in the case of patient H—— N——.

Case of H—— N——.

Diagnosis.—Psychosis, traumatic, following linear fracture of skull with concussion of brain, sustained in fall with airplane. A soldier of 22 years, previously a sophomore in college, of negative family history, has an airplane accident in which he sustains a linear fracture of the skull and extensive superficial burns; after a period of coma lasting three days he gradually regained consciousness; for a long time remained completely disoriented as to time and at present is only approximately oriented, almost four months after the accident. There is a complete amnesia for the accident and all circumstances immediately preceding and following it; there is a partial amnesia for all happenings since the time of the accident and for all happenings prior to the accident, the general tendency being for the amnesia to be less

marked for happenings which are the more remote from the time of the accident; yet the amnesia clearly affects happenings of many years. There are no focal symptoms, save a suggestion of a right-sided Babinski sign and rather marked equal increase of the knee jerks. Recommendation,—memory training by reëducation, exercises for stimulating attention, etc. Further investigation suggested,—X-ray plate of skull to show present condition of fracture; complete investigation by psychological methods.

This subject now spent several hours in the psychological laboratory where, through standard experimental methods, measurements were made of his various types of capacity and performance. Without describing the technique of these measurements in detail in this connection, the general picture, psychologically, was found to be one presenting integrity of simple processes of perception, retention, discrimination; normal attitudinal and emotional responses; with distinct looseness of grasp, ineffectual focalization of effort and weakness of synthetic attention, indicating definite inability to maintain a mental set, inability to follow complex instructions, and difficulty in sustaining mental effort.

The patient then remained in the hospital, being

given such medical care as the case seemed to warrant, and taking also systematic instruction and practice in typewriting and stenography, in an endeavor to improve through exercise some of the traits in which he was weak.

After two months in the hospital the question arose as to whether he might now be able to be discharged. General observation not affording very reliable comparative data, he came again to the laboratory and a complete series of measurements was again made, in order that his condition at that time might be quantitatively compared with his earlier state. In processes in which he was formerly *normal* (involving the simpler mental functions such as perception, discrimination, speed of reaction and movement, immediate retention) he showed no change. In processes in which he was formerly *somewhat feeble* (involving mainly exercise of previously established mental patterns) he had made up one-third of his previous defect. In processes in which he was previously *notably weak* (involving the higher mental functions, logical thought, following of complex directions, judgment of relations, sustained effort) he had made up one-half of his previous deficiency. His mode of attack in accomplishing tasks had very much improved. The random, trial and

error method used on the earlier occasion had given place to a more deliberate and systematic attack, with better comprehension of instructions and ability to hold to a set task for a longer period of time. Not only was the fact of these changes demonstrated, but the degree of the improvement and the degree of his approximation to the status of the average college sophomore was definitely measured. The incompleteness of recovery, with the very definite evidence of improvement, were now unmistakable, and could be relied on in the further treatment and disposition of the patient. Such experimental technique constitutes one of the most important aspects of the application of psychology in the neuropsychiatric hospital.

Briefly, then, the work of the psychological service in a neuropsychiatric hospital, in the writer's experience, has been the following: Through the intelligence examination to throw light on the clinical condition, the complete diagnosis, the proper disciplinary measures, the military or civil serviceability, and the most effective and expeditious disposition of patients. Through the further analysis of such data to make at least a suggestive contribution to the study of the factors operative in the production of the psychoneuroses. Through the inventory of the patient's special

aptitudes and educational equipment, to place him effectively for maximal therapeutic occupation. In a similar way to afford him aid in vocational adjustment and in the development of purposiveness and aim, in the effort to make of him a more balanced and a better adjusted personality. Through graphic records of the increments of functional capacity under physio- and mechanotherapy, to portray for his own encouragement and for the information of the physician the course of progress. Through intensive individual reëducation to direct and stimulate the patient in his recovery from specific symptoms and disabilities, thereby improving his general morale and his attitude toward the hospital and the service. Finally, through special experimental technique, to demonstrate the degree of rehabilitation and the approach to complete recovery in particular cases, in exact and comparable terms.

THE END

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